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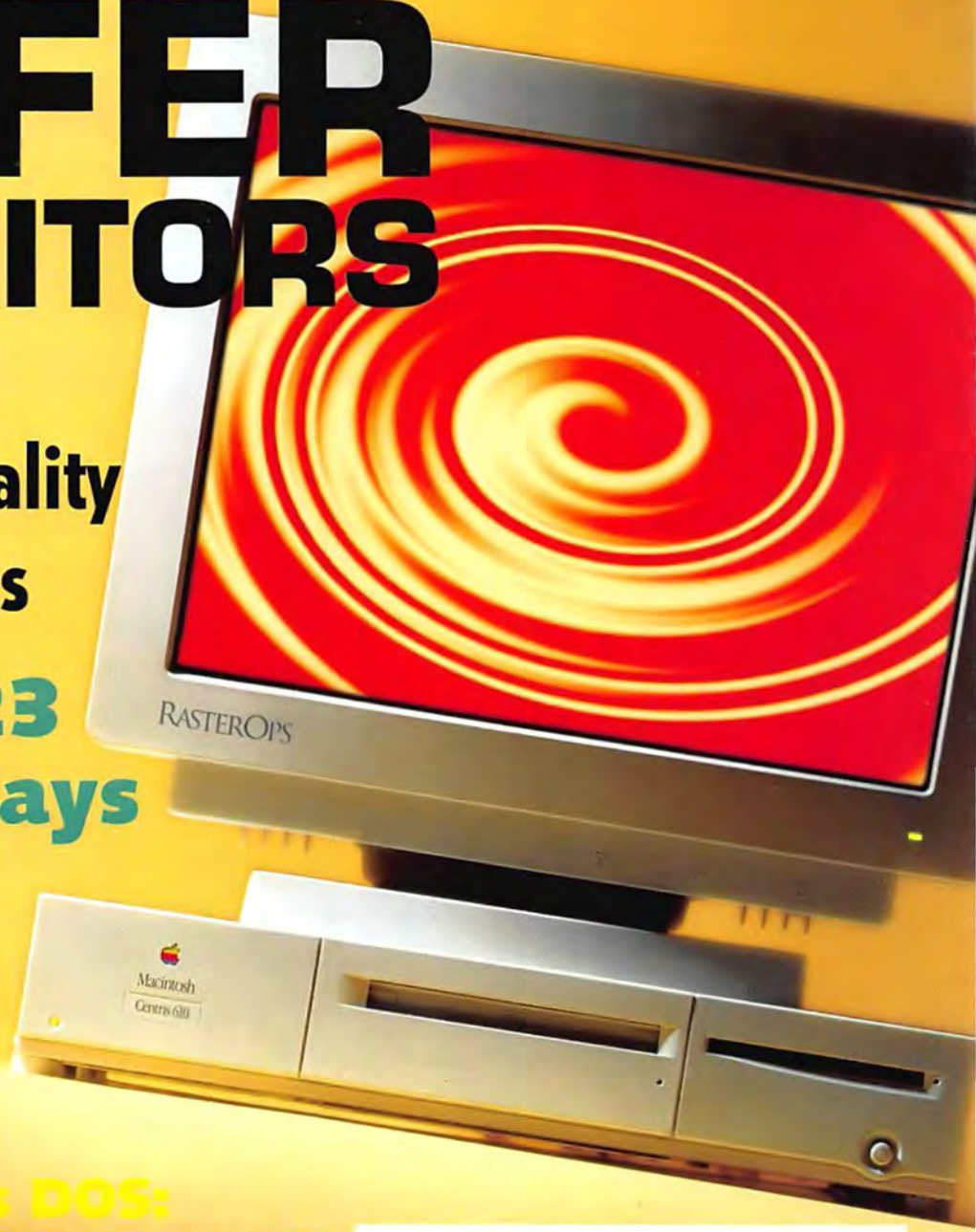

PLUS

Apple Does DOS:
The PC-Compatible Mac – page 42

DTP Showdown:
QuarkXPress vs. PageMaker

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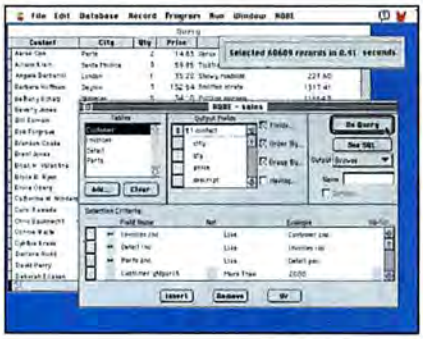

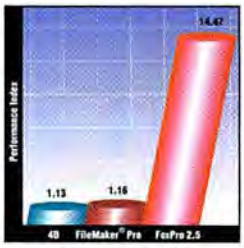

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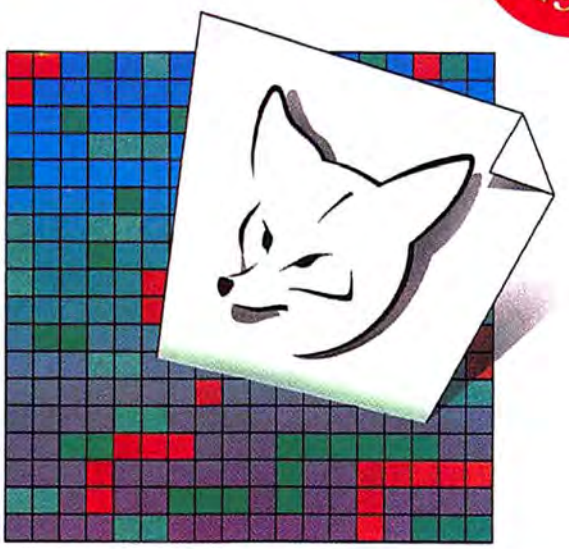

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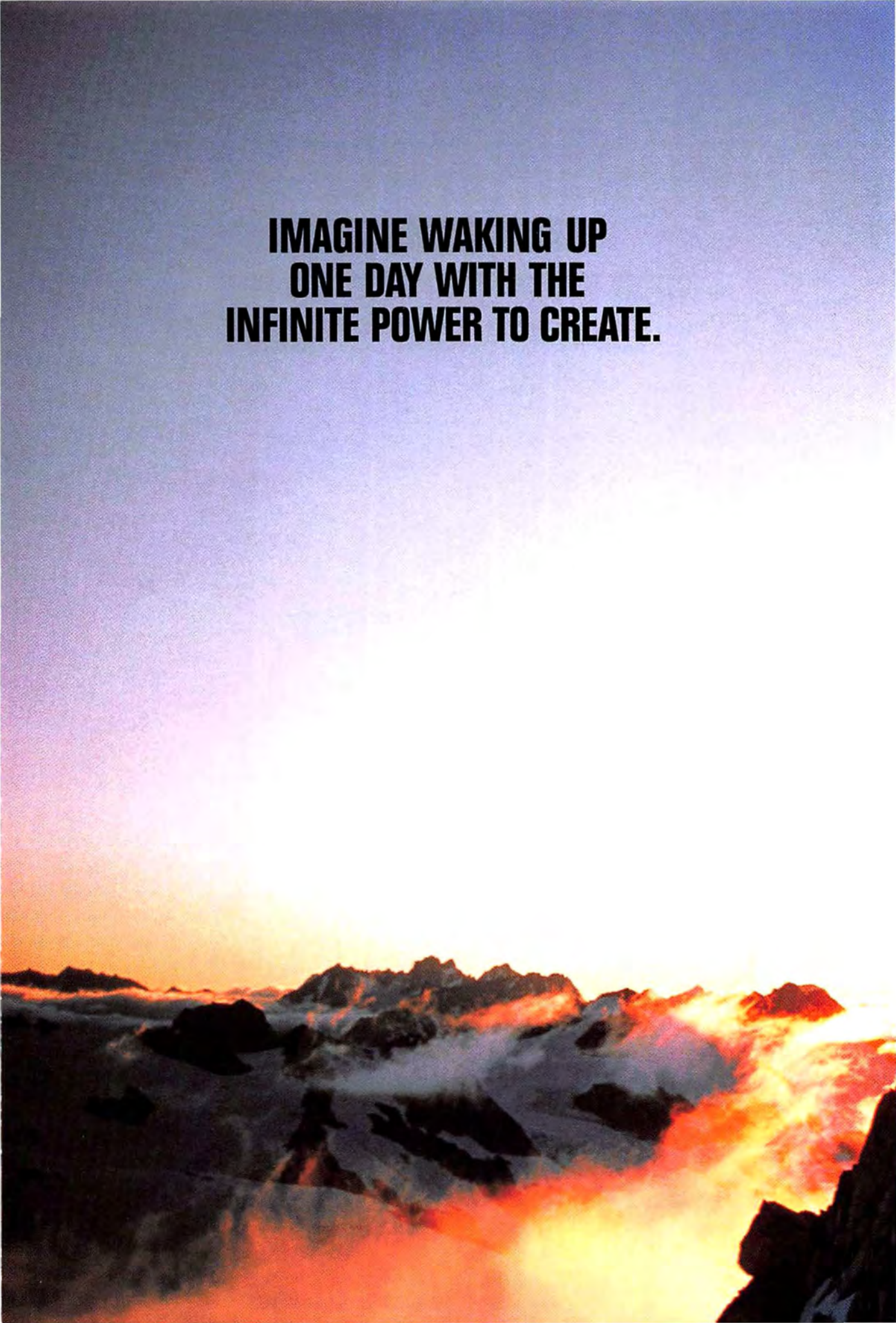

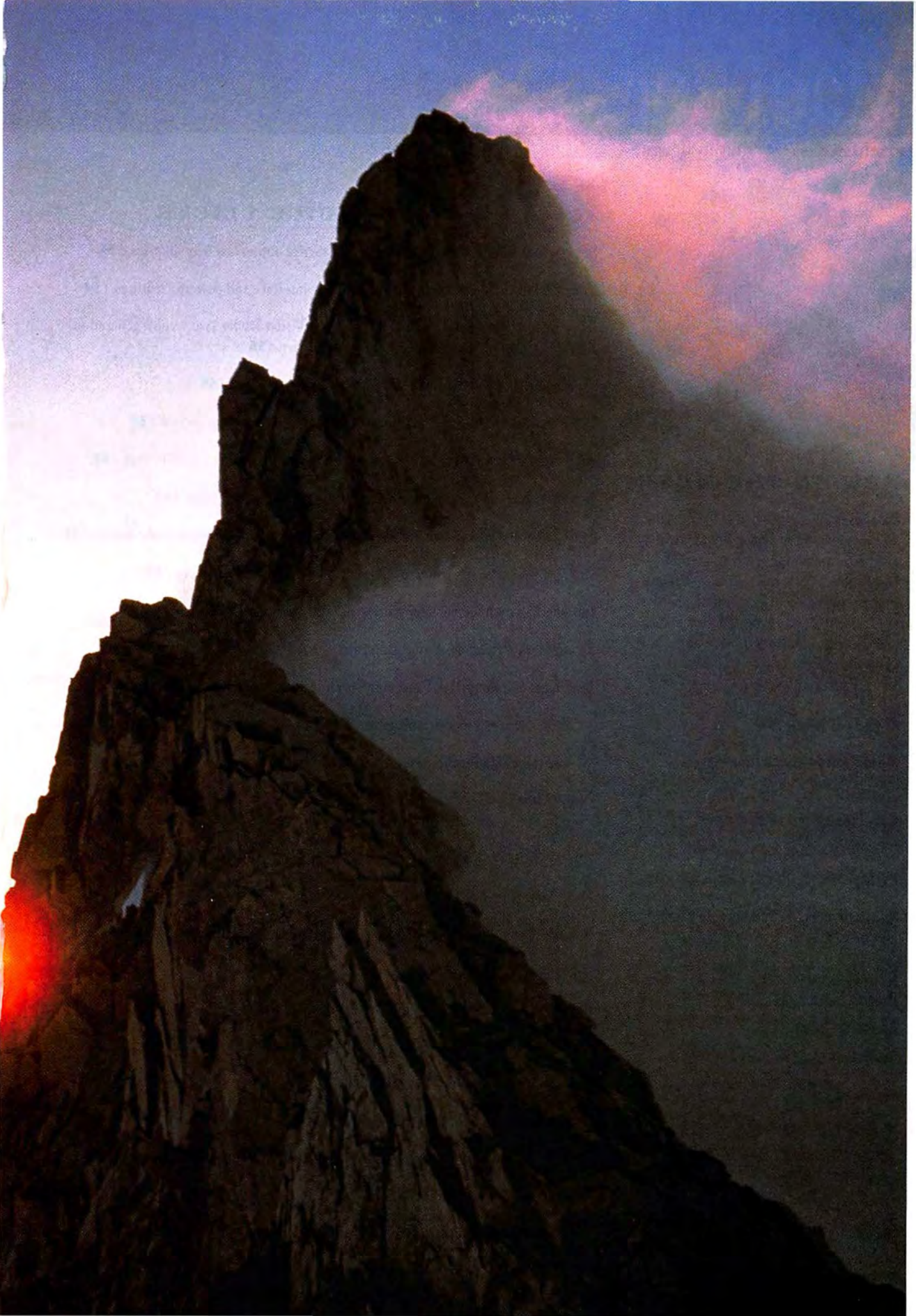

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Cover photo / GIAMPIERO BENVENUTI

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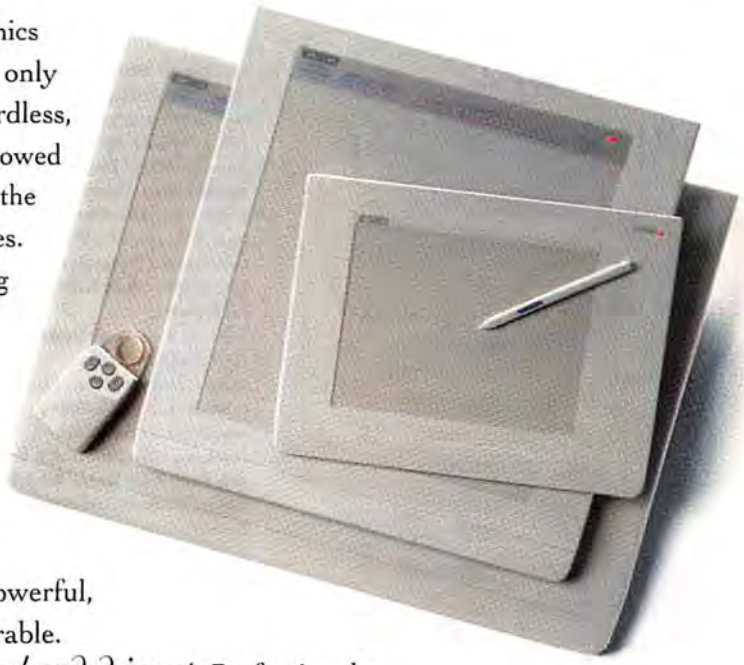

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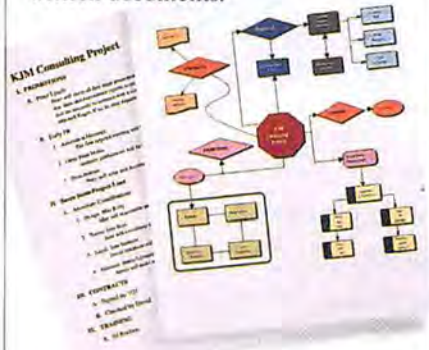

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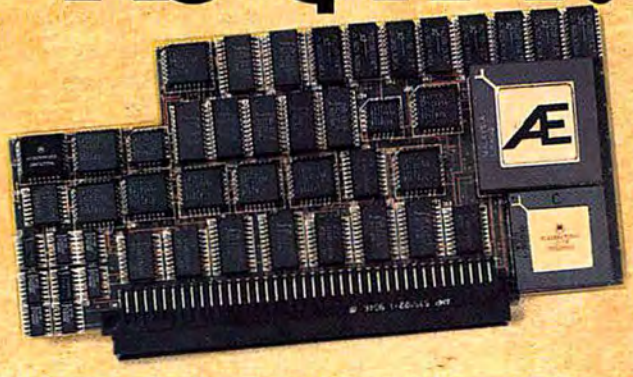

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CIRCLE 32 ON READER SERVICE CARD

About MacUser ...

A New Look

COMPLETELY REDESIGNING MACUSER from scratch was something *MacUser* Art & Design Director Lisa Orsini had only dreamed about doing.

After all, putting out a 300-page chart- and product-packed, info-rich technical publication every 20 working days could be seen as a sufficient design challenge in itself. But during her eight-year tenure here, Lisa has seen all the turbulence that makes magazine production an interesting ride, from the implementation of full four-color DTP production to changes in staff and editorial focus. Doing a redesign was *fun* turbulence.

And "the time was right," Lisa says.

MacUser is fully DTP-produced, which opens the door to all kinds of cost-cutting and time-saving design and production techniques; a smart redesign could take advantage of these. It was also the right time editorially. The magazine had built up a staff of seasoned professionals who knew what editorial tools they needed in order to present the varieties and levels of information in the magazine. A smart redesign would put the right tools into the editors' hands.

Art Director Lisa Orsini

Some editors asked for a new approach to features tables to fit in more products. All of them wanted to put more words on a page.

Clarifying the editorial needs was just the first step. Turning that collection of ideas into an interface, into something that conveys the look and feel of *MacUser*, took hundreds of interlocking small and large decisions.

Type was an early decision. It was quickly narrowed down to Minion, a flexible and readable multiple-master font that we would use for body text. From there came decisions about grids, hierarchies, colors . . . .

In all of this, Lisa turned to her trusty staff: senior associate art director Diane Dempsey, associate technical art director Peter Gould, art production manager Jan Rogers, and technical illustrator Mark Sweeney, plus independent design consultant Margery Cantor.

"It really was a cooperative venture," says Lisa, "and we needed to do a lot of experimenting."

What followed were endless meetings in which comps of the magazine's sections were presented and critiqued. Finally there was something that could be presented to the editors.

The last step was scrutinizing each choice for its workability under unpredictably changing circumstances.

"When you're doing comps," Lisa says, "you're doing them for a totally different purpose than real-world magazine design. You want to show off a particular design, so you assemble a combination of words, pictures, and display type that you know work together."

But when the ideas are put into practice and the 20-day cycle begins, reality shows its imperfect face and you wonder, is this really going to work?

We think it does. What do you think? / Nancy Groth

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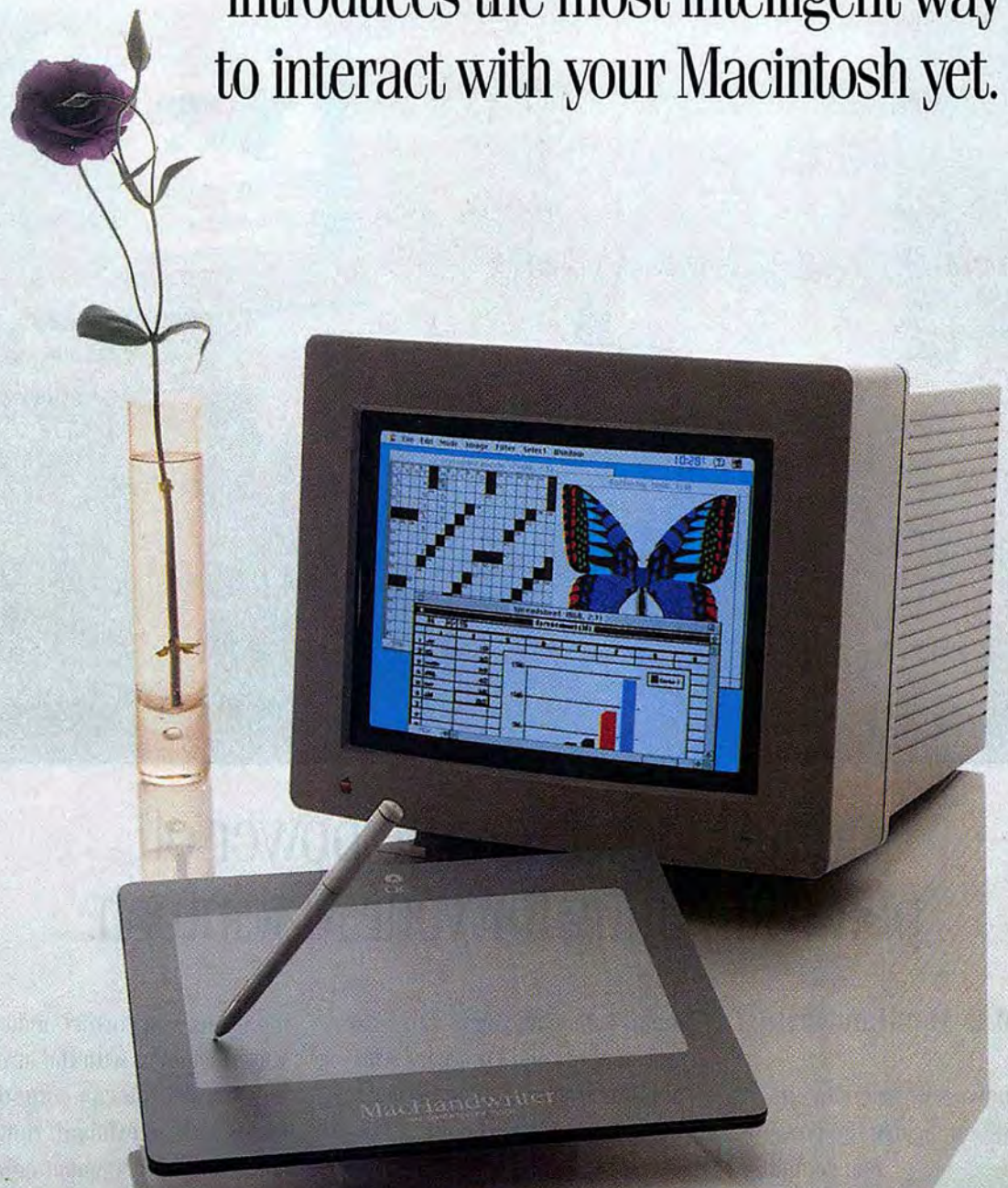

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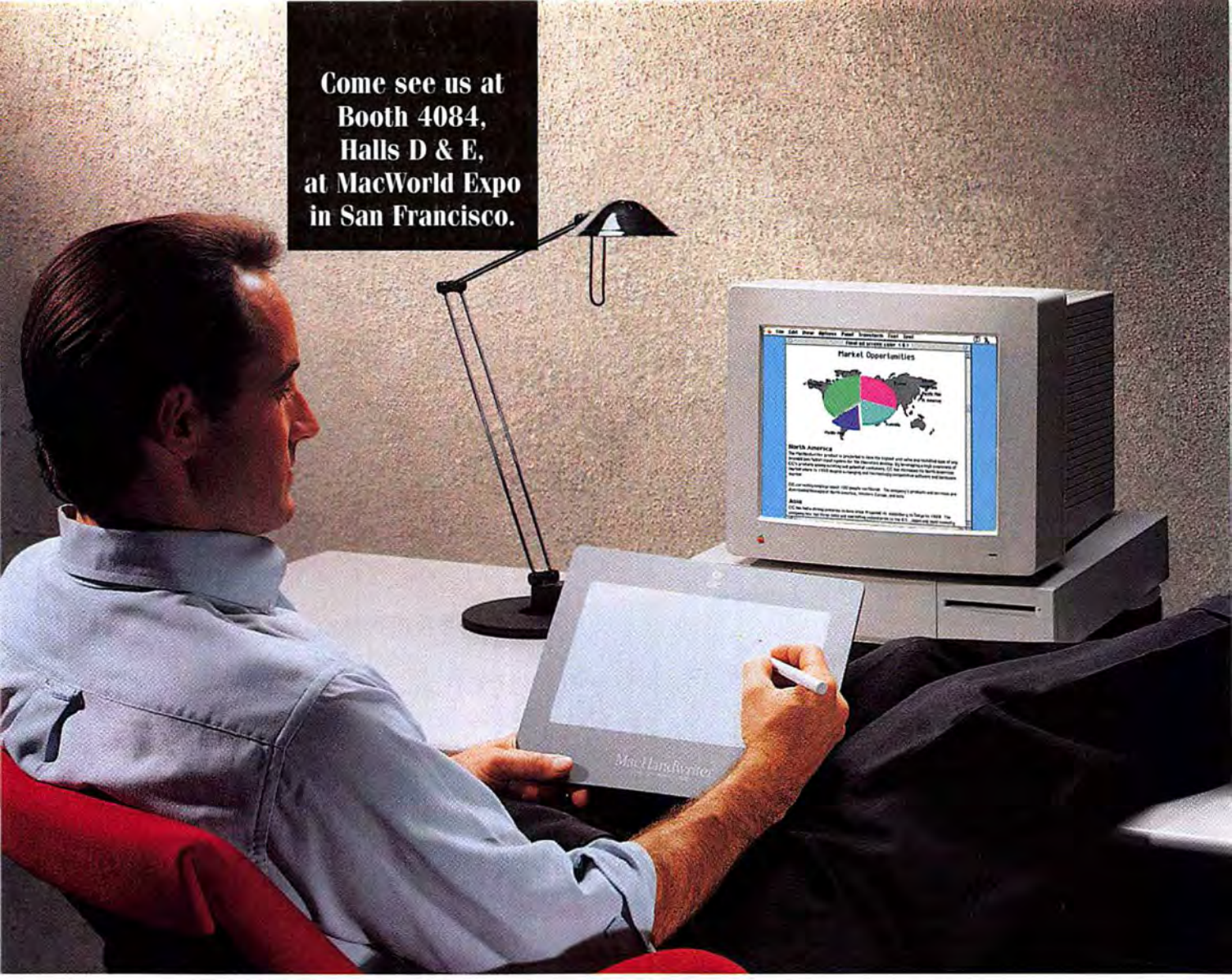

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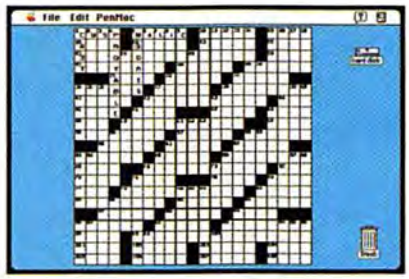

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*Voted #1 at PenExpo January 1993 and PenExpo September 1993. **This $199 (US) offer is valid only in the U.S. and Canada. Return privilege is 30-days provided the product is in resalable condition. For pricing information outside the U.S. and Canada, call (415) 802-7888. After February 28, 1994, MacHandwriter will be $399. Crosswords is developed and manufactured by Lyriq™ MacHandwriter is a registered trademark of Communication Intelligence Corporation. Macintosh is a registered trademark of Apple Computer, Inc. All other names or products are trademarks or registered trademarks of their respective companies.

The Apple Report On PowerPC

Macintosh Compatibility and Upgrades

PowerPC will easily outrun Intel's acclaimed Pentium microprocessor, but will do so at a fraction of the cost.

By taking advantage of superior RISC technology, PowerPC requires half the number of logic transistors as Pentium. And fewer transistors make for smaller, cheaper, more energy-efficient chips.

Macintosh with PowerPC will use System 7, so it will run the thousands of applications currently available for the Mac.®

Upon the arrival of Macintosh with PowerPC, dozens of new programs designed to take advantage of its speed will also be available.

MS-DOS and Windows users will be able to run all their programs on the PowerPC platform from Apple.*

Macintosh with PowerPC has received rave reviews from developers who report workstation-level performance running applications designed just for the PowerPC processor.

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PowerPC™ is coming. The revolutionary RISC-based microprocessor family created jointly by Apple, IBM and Motorola. It will be the engine that Apple uses to generate the first truly radical improvements in mainstream computing systems. Improvements in power, price/performance and functionality. It will also serve as the heart of the next generation of Macintosh® personal computers, coming in the first half of 1994. In anticipation of its arrival, Apple will be running a series of information-rich reports keeping you abreast of all the exciting new advancements you can expect from Macintosh with PowerPC.

Compatible with the Mac you're working with now.

Macintosh with PowerPC will bring a new level of performance to your desktop. Yet you can continue to work with all your current files, applications and peripherals in exactly the same way you work with them now. It's compatible with all the Macintosh computers and software you already own, protecting any investment you've already made with Apple.® There's no retraining. No rethinking. No re- anything.

A more powerful Macintosh.

PowerPC processors will first be incorporated into several mainstream and high-end Macintosh models, providing you with up to 2 to 4 times the performance of Motorola's 68040 or Intel's 80486 chips using comparable applications designed for PowerPC.

We've made it incredibly easy to upgrade the Macintosh you already own to PowerPC.

Down the road, PowerPC will continue to fuel succeeding generations of Apple Macintosh computers, delivering equally impressive results.

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Apple

Sit down and work on a Macintosh with PowerPC, and you'll quickly find that it's still a Macintosh. As easy to use as ever. As forgiving as ever. As human as ever.

Apple has already announced plans to ship upgrade products concurrently with the initial introduction of Macintosh with PowerPC systems.

Upgrades have been announced for the Macintosh Quadra® 610, 650, 660AV, 700, 800, 840AV, 900 and 950, the Macintosh Centris™ 610 and 650, the Macintosh IIvx and the popular Macintosh Performa® 600. More will follow.

Naturally, upgrade prices will vary by model. You can expect them to start at under $1,000.

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LETTERS

Playing Doctor

ANDY IHNATKO'S column "Cheap Health Insurance" (November '93, page 27) does much to simplify the confusion concerning computer-related health problems. Unfortunately, he goes a little too far. For example, repetitive-stress injury (RSI) and carpal-tunnel syndrome (CTS) are not "the same thing." RSI is pain and swelling from inflammation of joints and tendons from excessive pressure or motion. CTS is pain, numbness, and weakness from compression of the nerve that passes through the wrist joint (that is, the carpal tunnel). You may say I'm quibbling; obviously, swelling of the wrist joint from RSI can cause CTS.

Andy goes on to say that flexion upward of the wrist should be avoided. Although pressure from a splint can aggravate RSI, flexion upward stretches the carpal tunnel open and removes some pressure from the nerve in CTS. So, knowing whether you have RSI, CTS, or both makes a difference in how you treat the problem. But I can't argue with Andy's advice to see a doctor. With the looming changes in health care, we need all the referrals we can get.

Christopher Cimino, M.D.
Bronx, NY

AFTER READING Andy Ihnatko's column on health problems associated with computer use, I'd like to suggest a solution that's often overlooked: Buy a good chair! I can set my fully adjustable office chair to a position that avoids putting any stress on my wrists. A good chair is expensive, but if you talk to people who have had wrist problems, you'll find their injury is painful and that insurance never pays all the bills. In this light, a good chair is very cheap.

Mike Galbreath
Lubbock, TX

Don't Debase My Database

I'M A REGISTERED owner and longtime user of 4th Dimension, FileMaker Pro, and Panorama II. I'm also a longtime reader of *MacUser*, and I'm concerned about what was said in "Do-It-Yourself Databases" (November '93, page 126).

ProVUE's Panorama II received short shrift, but much was made of the attributes of Claris' FileMaker Pro. No mention was made of PanTalk, Panorama II's powerful macro language, which is nearly a full-scale programming language. The reviewer also apparently missed the application's Design Window, in which much of the field-formatting work is done. The reviewer would have discovered immediately that new fields can indeed be added to the end of the list; there is no default setting whatsoever.

Had she taken a truly in-depth look at Panorama II, the reviewer would have discovered, as I have, that beauty (FileMaker Pro) is indeed only skin-deep.

Mike Retherford
Corvallis, OR

IT MUST BE difficult for software reviewers to decide which features to mention in an article. However, when they do describe features, they should do so accurately. Some of the reviewer's descriptions in "Do-It-Yourself Databases" are misleading.

What did the reviewer find difficult about placing, sizing, and moving fields in Panorama II's forms design? In each instance, all you do is click and drag with the cell tool. Panorama II has many options and tools that control grids, alignment, spacing, tabs, and colors. It also has a special feature called Cluster Resize, which resizes a group of objects while repositioning adjacent objects appropriately.

Write to Letters

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To send your letter electronically via MCI Mail, CompuServe, or ZiffNet/Mac (our on-line service), see "How to Reach Us," on page 4. All letters become the property of *MacUser*, and we reserve the right to edit any letters we print. Please include a return address and a daytime phone number.

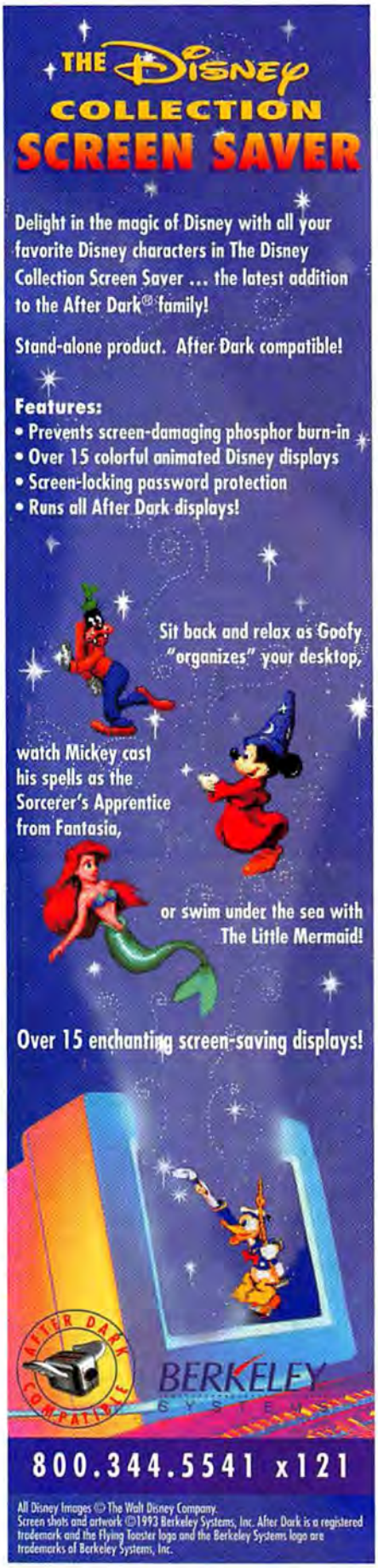
OPEN FOLDER

Even Jerry Seinfeld has to hustle to keep current with the latest Mac models — as readers wrote in to point out after the sitcom star upgraded the Mac Classic on his show to a Duo Dock (Letters, November '93, page 14). Michael E. Quigley, of New Castle, Delaware, also reports that characters on *Melrose Place* and *Beverly Hills, 90210* use Macs (the former even showed *MacUser* associate technical art director Peter Gould's illustration of Apple's AudioVision 14 Display on-screen recently). "What does the future hold?" Michael asks. "Newtons on *Northern Exposure?* PowerPCs on *Murphy Brown?* Or Windows on *Beavis and Butt-head?*"

Unless you've been extinct for 65 million years, you probably know that the Mac costarred with dinosaurs in the movie *Jurassic Park*, as was noted in the November issue. Mike Backes, the film's display-graphics supervisor, sent us a fax (on Jurassic Park stationery!) to tell us how it all came together. "Thanks in part to the use of Macs, we finished filming the control-room sequences three whole days ahead of schedule," Mike reports. "The movie ended up doing OK as well."

A fax from Jurassic Park isn't the only interesting item that's crossed our desks lately. The premier issue of *Know-How* magazine caught our eye. Subtitled "A New Kind of Women's Magazine" and underwritten by General Motors, it includes a story called "All Plugged In," which offers advice on how women can get past "clinging-vine mode" when learning about computers. Under the subhead "Saying 'phooey!' to GUIs," *Know-How* dismisses the Mac's visual interface: "... many people don't have the hand-eye coordination the point-and-click methodology calls for." Wouldn't want to break a nail, after all.

What do you think about that? Write to Open Folder, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. The usual caveats about letters apply.



I would like to know how long it took each program to import those 1,000 records and what size the resulting 1,000-record files were. I bet Panorama II took a couple seconds to import the records, compared to several minutes for the others. I've found Panorama II's files to be about one-fourth the size of equivalent FileMaker Pro files — that is, a 1.2-megabyte FileMaker Pro file would be about 325K in Panorama II.

The reviewer makes it sound as if only Panorama II would lose unsaved data because of a crash. Try pulling the plug during each application's sort or while FileMaker Pro is performing its nonoptional autosave. Relaunch, and then see how easily each database is reconstructed.

Paul Chance
Santa Cruz, CA

/ Both readers are correct in praising Panorama II's Design Window; we should have mentioned it as another tool for adding and changing fields. As for Panorama II's rich scripting language, PanTalk, we felt it was outside the scope of our story. We focused on capabilities beginners could access without using a programming language — capabilities amply present in Panorama II, as its rating of four and a half mice (the same as FileMaker Pro's) attests. / JS

I'D LIKE to comment on one of Jan Smith's complaints about Helix Express. She criticized its interface as being unusual. I agree that from a programmer's viewpoint, its icon-driven interface is as far away from the dBASE dot prompt as you can get, but I find it the truest and most elegant implementation of the Mac visual philosophy in any database program. To complain about the Helix Express interface is similar to a DOS user complaining that the Mac doesn't have a command line.

Chuck Hinkle
Bellaire, TX

Bratty Adolescents

BACK IN 1988, when I first began to receive *MacUser*, the letters to the editor were of a sweeter timbre than they are today. When Macs and desktop publishing were born, novice *MacUser* readers, like hungry baby birds in a nest with their little mouths open, were grateful for any crumbs of information they received from the *MacUser* editors.

Just as some children grow up to be rude, disrespectful, self-righteous adolescents, some members of the Mac community and *MacUser* readers have turned out the same way. I'm getting disgusted by the increasingly obnoxious and picayune attitudes of Mac users, especially the Mac novices, who don't know how easy they have it, and the nouveaux experts. Maybe what they need is a good spanking.

David Weisman
San Rafael, CA

Time = Money = Mac

IN JANUARY 1993, I considered purchasing a Mac. My vision was clouded by images of getting more hardware for the money, so I bought a 486 screamer. More is right — the thing was as big as a refrigerator. I sold the whole system and bought a PowerBook 145. Even though I bought my PowerBook when Mac prices were comparable to PC prices, I now feel that Macs have always been less expensive than PCs. Why? Because I value my time. As a student, I spend mine at school. Now I pay more attention, take better notes, and waste no time fiddling with the operating system.

I still have a 386 lying around, and I'd use it as a water-displacement device in my toilet, but it doesn't fit. I'm so glad I never have to see a config.sys or autoexec.bat file again. I have seen the light, and it's in the shape of an Apple! Eeep!

Oren A. Levy
Davis, CA

A New Look

FOR YEARS, I have looked to *MacUser* as my "informed source" for information on the Macintosh world. For just as many years, I have worked in magazine and book publishing, in design and production, and have watched the desktop revolution transform an industry. I have also listened to designers complain about what the Mac has wrought on their domain. But I knew it was just a matter of time before fonts were up to pre-Mac kerning standards, before Mac design got over its infatuation with ease of implementation and became just another use of the Mac as tool, before the seams and wrinkles of illustration on the Mac disappeared and Mac-based illustration was considered not a novelty but another genre. Well, the time is now, and there is no more excuse for bad design. I realize that not everyone shares this aesthetic view. But as a magazine that reflects the cutting edge in

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Poor Claris. Once again, Canvas™ is running circles around MacDraw® Pro. In fact, they are still trying to catch up to Canvas 3 while we've added dozens of new features and enhancements to create Canvas 3.5. Like 3-D extrusions of text and graphics, enveloping of text and graphics, smart lines, fine kerning, fractals, automatic concentric circles and spirals, and a tool loader that allows you to add tools as you work. There's even a versatile pressure-sensitive freehand Bézier pen tool. And Canvas 3.5 has really outdone itself with new improvements including object blends, binding of text to shapes and curves, Beziér text conversions, and macro windows. Which is just the beginning, because Canvas also includes all the great features of 3.0 like custom parallel lines and curves, our unique SmartMouse™, and more. Comparing Canvas to the competition is like comparing a superbike to a tricycle. And only Canvas is self-upgrading, allowing you to add new tools, effects and file translators at will. Last but not least, while MacDraw Pro is idling somewhere back in the Dark Ages, Canvas features seamless file sharing with its recently released Windows version. Add it all up, and it's easy to see that it's time to shift gears to Canvas. For the ultimate in value and performance, Canvas gives you the ride of your life. So go ahead and hop on.

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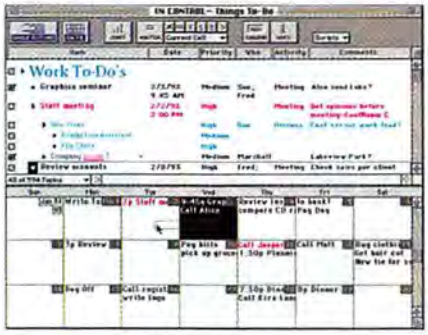

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Mac technology editorially, *MacUser* might want to do the same artistically.

Dany Drennan
New York, NY

/ So whaddaya think about the new design? / PP

Elderly Paleontologists!

THANK YOU FOR your review of the top CD-ROMs ("The Top 50 CD-ROMs," November '93, page 90). As wonderfully entertaining as these CD-ROMs must be (color! 3-D! QuickTime movies! real animal sounds!), I wonder why I can't use my computer to browse through old newspapers fully reproduced page by page.

Maybe I'm just a two-dimensional guy, but it would be fun to see what people had delivered to their doorsteps in 1956. I think it would be more valuable than anything else in your top 50 and more marketable to people who want something other than games on the screen. My library has had newspapers on microfiche for years. Isn't my computer supposed to let me do this kind of thing at home?

Don Kardong
Spokane, WA

Fun, Fun, Fun

ISN'T THERE ROOM in your magazine for a page or two on games and entertainment? The Mac is no longer perceived as simply a toy for junior-high-school students: Let's abandon our outdated defensiveness and embrace what the Mac is: very *cool*. I'd like to see a few articles and awards for the real reason I bought my high-res monitor.

Scott C. Love
Denver, CO

Keep the Wrap On

PHILIP RUSSELL ADVISED consumers that the first thing one should do after removing the shrink-wrap from a new program is to lock the floppy disks (Tip Sheet, October '93, page 159). Even before opening the disk envelope, cautious consumers should peruse the manual to make sure the product is compatible with their hardware and software. After purchasing SuperATM, for example, I found in the manual that it does not work with my laser printer or with the program I use most frequently. Because the disks were unopened, I was able to return them.

Unfortunately, most developers include this sort of information only in a Read Me file on the disk. Perhaps a hard copy of the Read Me file should be enclosed so users can know about conflicts before committing to a product.

Diane Hall
Manhattan, MT

Poky? Hokey!

I WANT TO COMMENT on Gregory Wasson's lukewarm review of the Apple LaserWriter Select 300 (October '93, page 52). I purchased a Select 300 after owning a Personal LaserWriter LS for a couple years. The Select is a great improvement over the LS in speed, quality, and features, at a very reasonable price. I installed the PhotoGrade upgrade myself, giving the Select 300 grayscale-printing capability that was previously unavailable for this price. The Select 300, connected to my Centris 610, is much, much quicker than the LS ever was, and the FinePrint technology measurably improves print quality. True, the Select 300 is not PostScript, but with QuickDraw, the Select 300 is one dandy little printer, not the "poky" thing the reviewer described.

Duane Gossett
Gainesboro, TN

Share, Shareware Alike

I JUST FINISHED reading "The 1993 MacUser Shareware Awards" (October '93, page 143) and was impressed by all the programs available on the honor system. I already have a few shareware programs, most given to me by friends. I would like to know how people who don't have modems can get the programs you mention. I don't have a modem, and I'm sure a lot of other people who don't have one would like to know how to get shareware without having to subscribe to an on-line service.

Tony Hauth
Salem, OR

/ Really, Tony, it's high time you got a modem. If you want to get shareware without a modem, you need a CD-ROM drive. The following sources sell shareware on CD-ROM: BMUG, 510-549-2684; Boston Computer Society (BCS), 617-252-0600; and Pacific HiTech, 801-278-2042. / PP

Made in Japan

I'D LIKE TO respond to John Dvorak's column "The Apple Merger" (October '93, page 248). I am one of many fervent Mac users in

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Japan and disagree with his comments about the future of the Mac here. I do not believe the Mac would be dead in nine months if Apple were to merge with a Japanese company. Apple's market share in Japan is nearly 10 percent, and in 1992, Japanese companies and individuals bought almost 200,000 Macs. Nearly 100,000 people attended the 1993 Macworld Expo in Tokyo. These are not little successes. Dvorak should not spread the prejudice that "Japan, Inc." is such a monster.

It is American companies such as Intel, Motorola, and Microsoft that can kill Apple in Japan and the rest of the world or let it live.

Hiroshi Sugimori
Sakai, Japan

Fixer-Upper

IN JANUARY 1991, I received my PowerBook 170. From then until now, I occasionally had a floppy disk that worked perfectly fine in my desktop Mac but elicited a "This is not a Macintosh disk" message on my PowerBook. I honestly believed the floppy disks I owned were faulty. Until I read "Five Free Fixes" (November '93, page 195), it never occurred to me that my PowerBook might be defective.

With the information provided at hand, I called Apple SOS. I explained the problem I was having and referred to your article. The gentleman I spoke with "researched" the case for a few minutes. When he finally got back on the line, he essentially denied that the PowerBook 170 model had ever had a problem of "inadequate shielding on the backlight converter" and he questioned the accuracy of your article.

I have been a reader of *MacUser* for several years. I have found your publication to be honest, straightforward, and extremely helpful. Apple's denial of a shielding flaw is more than likely an attempt by Apple to cover up its design flaws by lying. I think Apple has a lot to learn about the treatment of its customers. However, I'd like to see your proof of the "inadequate shielding" problem in 170 models with serial numbers lower than CK205xxx. Thank you for your time, and keep up the good work.

Philip Katz
Roslyn, NY

/ Mr. Katz apparently caught a technician on a bad day. On his second call to Apple SOS, the shielding problem was acknowledged but he was told that intermittent drive problems weren't covered. My follow-up call (incognito) cleared up the miscommunication — the problem could be intermittent, but it had to be reproducible during testing before it could be fixed. So, although there's "proof" in the form of tech-service notes and AppleLink notices (and personal experience), there's no need to use it: Apple SOS freely acknowledges the described problem in the listed models. / SZA

That Advice Blows

I'M REALLY STUNNED by Bob and Andy's advice to A.B. Thompson in the November '93 issue (Help Folder, page 212). C'mon, anybody who's had Electrostatic Discharge 101 knows the three best ways to generate static are to pull off a piece of Scotch tape, walk across a carpet, or to *blow or suck air across a nonconductive surface.*

You need a special vacuum cleaner that has ESD-safe components and ionizers in the inlets. Your mom's vacuum grows a cloud of electrons of about 30,000 volts around the tip. No amount of protection in the chips can siphon this cloud to the ground, so it's like hooking your CPU to one of those cross-country power lines.

Now go to your closets and pray. Then print a correction in 72-point bold. Then send A.B. a check to replace the old motherboard.

Foster Glascock
via ZiffNet/Mac

CORRECTIONS

Shortly after we went to press with "The MacUser 100" (December '93, page 131), Connectix acquired the PowerBook utility On The Road, mentioned on page 134. For product information, call Connectix at 800-950-5880 or 415-571-5100.

In "Choosing the Right Removable" (November '93, page 106), Figure 2 should have shown that the Alphatronix Inspire IIf took 152.509 seconds to complete the speed tests, making it the second-fastest of the 650-megabyte drives tested.

In "Ethernet for PowerBooks" (November '93, page 165), the software listed in Table 1 for Focus Enhancements' EtherLAN SC-T should have been EtherLAN SC Setup. In addition, Focus owns the technology used in both the EtherLAN SC-T and Technology Works' Ethernet SC-T.

The toll-free phone number listed for Technology Works (The Mac Workshop, November '93, page 201) should have been 800-688-7466. The regular business number is 512-794-8533.

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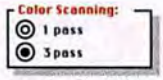

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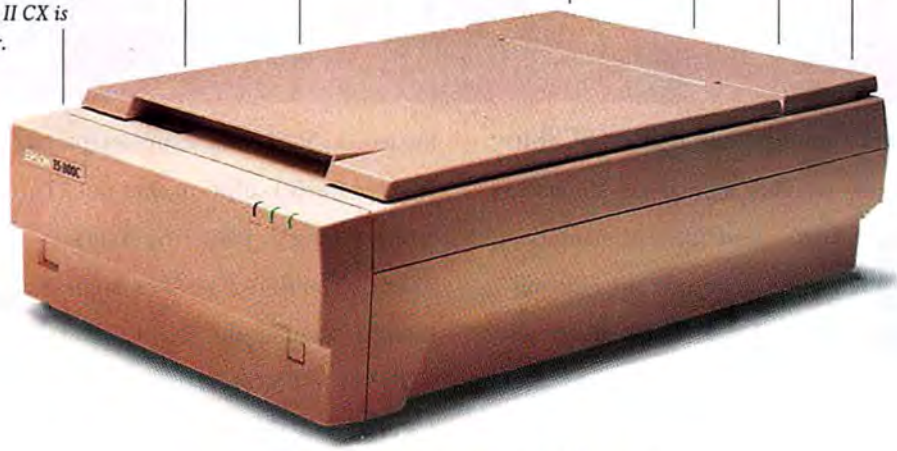

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CIRCLE **86** ON READER SERVICE CARD

Looking for Changes

IT'S THAT VISION THING AGAIN.

George Bush didn't understand why people wanted one; IBM's CEO, Louis Gerstner, declared that a vision was the last thing IBM needed; and President Clinton has put forth so many visions that you can pick any flavor you like. Enter Apple. After months of not talking about the company's plans, Apple president and CEO Michael Spindler used his keynote address at last fall's Comdex to share his vision of Apple's future.

Right off the bat, Spindler pledged that Apple would be the customer-advocacy company in this industry and followed up by promising that never again would Apple position itself as the maker of higher-priced computers. Both of these promises basically acknowledge market realities. Apple's single greatest strength continues to be that the company builds products that are easy to set up and use. And to increase its market share, Apple must court customers who won't pay a premium for its wares.

Spindler's choice of Comdex as the venue for this long-awaited speech reflects another part of Apple's vision: to fit into the mainstream-computing environment. To that end, Spindler demonstrated a PowerPC Mac running Windows programs and a Newton MessagePad synchronizing data with an IBM PC clone running Windows. Stating that Apple's RISC-based PowerPC machines would be aggressively priced, Spindler showed a PowerPC Mac running circles around a Pentium-based clone.

Apple's commitment to fitting into mainstream computing (read Intel/Windows) may seem sacrilegious to zealots, but for countless corporate Mac advocates, it's welcome news indeed.

Spindler also talked about how Apple's control of both hardware and software enables the company to provide integrated solutions. In the coming year, you'll see Apple focusing on publishing, mobility, education, and multimedia. Most important, Spindler noted that while most of the industry has reduced research spending levels, Apple remains committed to being the leader in innovation by continuing to invest more in R&D. Good news for us loyal Mac users.

Never again will Apple position itself as the maker of higher-priced computers, pledges president and CEO Michael Spindler.

A New Look

Speaking of vision, you have probably noticed we have a new vision of our own. *MacUser*'s redesign was based in part on reader research we conducted to find out how we could improve the magazine. Among other things, we learned that readers wanted to identify sections more easily and that they wanted to be able to skim the magazine for highlights. We've done several things to address both of these desires, but don't worry — we haven't changed the location of sections and columns. You'll find them in the same places they were in the last issue.

The New on the Menu section has expanded to six pages, which means twice the amount of trends analysis and news to help you keep up with the ever-changing Mac industry. Besides new-product coverage, we'll also be providing such regular items as PowerPC Update; the Macintosh Price Index; and the ZMac Utility of the Month, a free utility you can download from CompuServe.

Like New on the Menu, the Reviews section is also expanding. As in the past, the latest products will be reviewed each month, only now we'll review more of them. We're continuing to extend our lab resources into reviews, so look for more test results in upcoming reviews.

Feature stories will continue to focus on comprehensive product comparisons. We've moved "The Bottom Line" up to the front of the feature articles and redesigned it to include a chart of the most important things you need to know about the products compared in each article. Editors' top choices in a category are now designated with a "MacUser RECOMMENDS" logo, so you can zero in on the best products even faster. Finally, we've redesigned our features charts in order to make them both more compact and easier to read.

The last section of the magazine, which is now called Hands On, is where our departments reside. When we conducted our research, readers told us that besides product comparisons, they wanted tutorials and practical tips. So, we've focused the departments on practical how-to articles and user tips from industry experts and readers.

Starting 1994 with a new look is just one of the things we're excited about this year. With the advent of new products based on the PowerPC architecture, 1994 should be a watershed year for Apple, third-party developers, and users.

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ANDY IHNATKO

The Answer Machine

MODEMS ARE INSANELY COOL, as you already know if you own one. Even back when a

modem laughably equipped by today's standards sold for as much as a third-hand Volkswagen in good condition, you had to look hard to find owners dissatisfied with their purchase. And now that modem prices have fallen to the point where you can get one free by buying one of many software packages, there's barely any excuse for not at least dipping your toes into the on-line data stream.

But hey, this is a consumer column, not a home-shopping cable channel. I'm not here to talk about the thrill of using a modem to get an up-to-the-second weather map for only $12, the high-tech rush of spending a hundred bucks searching on-line national phone directories for everyone named Marlon Brando, or the fascination of spending an hour in a live electronic chat with a guy who played a supporting role in *Green Acres*. I'm here to explain why a consumer equipped with a modem and seeking support for that latest hardware or software acquisition has a leg up on other consumers armed with only a telephone and a pad of paper.

Ask Anyone

One key benefit of having a good user group in your area is the prospect of showing up at any time and knowing you'll find a roomful of People Who've Been There and are willing to tell you all about it. An on-line service, whether it's a free public BBS run by a user group or a pricier commercial entity such as CompuServe, America Online, or even *MacUser*'s own ZiffNet/Mac is an electronic version of such a room. The best part, of course, is that most of the people you meet there couldn't care less whether the product you need information about sells like gangbusters or tanks completely.

Yes, log in asking for opinions on the two leading disk-recovery aids you're trying to choose between, and you're likely to receive a pile of responses ranging in quality from the directness of Beavis and Butt-head to the savvy and depth of a professional in the data-recovery field. In all likelihood, you'll even get a recommendation for a product that you haven't heard of.

Equally valuable are the timely reports of bugs, ranging from the sledgehammerly serious to the narrow and vague sort that would affect only those of you who own an accelerated Mac SE. I'm almost loath to drive home such a simple and basic point, but the fact of the matter is that the one — I mean it, the *only* — truly reliable source of product support in this industry is, always has been, and always *will* be the support you get from fellow users. Although some companies are better than others at tenderly taking the hands of their customers, gazing soulfully into their eyes, and seeing to it that they understand everything they want or need to know about a product, the most surefire way of getting thorough and truthful answers still is to pose a question on a public on-line message forum.

PROBLEM:

Good help is hard to find, especially if you use a computer.

SOLUTION:

A magic box with the answer to every (computer) question you've ever had.

Corporate Support

Long ago, the studlier companies became hip to the advantages of an on-line existence. For a relatively modest outlay in cash and humanpower, a presence of any sort in the on-line community allows them to serve vast segments of their customer bases quickly and efficiently. Now every company's getting into the act to one degree or another — and for better or worse, taking advantage of this usually requires that you have an account on a commercial on-line service.

Corporate product support comes in many guises. At minimum, corporate on-line support means maintaining a small list of electronic addresses for receiving correspondence. This in itself is not too shabby. E-mail is considerably faster than paper mail, and although not as immediate as voice communication, it also lets you avoid being put endlessly on hold or playing master-level games of telephone tag.

Also, be aware that on-line support is still perceived as a somewhat minor piece of the communications pie; a letter written, stamped, and mailed to a product manager might bounce around exclusively within a group of form-letter-generating administrative assistants, but even today, most *electronic* mail is read directly by the addressee. Just like I said a couple of months ago, it always pays to call the folks who publish the software you use most frequently and ask for a complete list of contact names and addresses, including the various on-line ones.

A more serious attempt at on-line support takes the form of sponsorship of an entire forum on a commercial on-line service, devoted to the company's products.

On the forum, you will be able to find bug reports; press releases; announcements; various utilities and templates the company couldn't include in the shipping product; and, best of all, product updaters. These small, free applications can update whatever version of the product you currently have on your hard disk to the very latest minor version.

For instance, with a modem, users of Fifth Generation Systems' CopyDoubler 2.0 were recently able to find out about an extremely minor bug as soon as the company had nailed it down; moreover, they were able to immediately download an updater to version 2.01 that effectively corrected the problem.

Although a company certainly won't just *give* you an upgrade for which it normally charges $50, it should be more than willing to bypass the normal $10 disk-and-shipping charge to update your old app to one that will work with the latest version of the system software.

Typically, all of the above is otherwise available only by phoning or writing to the company on a fairly regular basis, asking the folks there what's happening, and dishing out some dough from time to time.

The next question that logically fits under this heading is, "If corporate on-line support is generally available only from commercial services, *which* service should I subscribe to?" Well, that's impossible to answer; most companies maintain a serious presence on only one service (although a few of the bigger companies are on several), so a useful answer depends on whose support you're fishing for.

Call your software's publishers and inquire about their on-line presence, and you'll find yourself sitting on velvet. In fact, there's only one on-line entity I can heartily endorse, and it happens to be the subject of the final segment of this telecom troika:

Getting hard information out of Apple about anything is certainly one of the most pressing problems facing Mac users today. Anyone who has tried knows that at times, dealing with the corporation and its dealers is like asking your parents for permission to go to an out-of-state rock concert: Dad tells you to ask your mother; Mom refers the matter back to Dad.

BESIDES APPLELINK, there are two little-publicized Apple on-line entities that are crammed to the gills with official items of interest. They're available to anyone who knows how to get at them and are absolutely free, to boot.

Apple's Customer Assistance Center (800-767-2775) is a reasonable source for many basic answers, but it's hardly a panacea. Enter the modem. Yes, you can subscribe to AppleLink, Apple's "official" on-line service, and indeed, it's loaded with wheelbarrowsful of useful information on Apple services and products. In addition,

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CIRCLE **58** ON READER SERVICE CARD

it's the closest thing to an official on-line service the Mac community has; although the pervasiveness of gateways (they let you send mail from one electronic service to another) has helped make the membership base of individual services largely irrelevant, be assured that if the existence of the Mac somehow greases the palm of the people you need to communicate with, chances are excellent that they have an AppleLink account. For information on subscribing to AppleLink, call 408-974-3309.

But, besides AppleLink, two little-publicized Apple on-line entities are crammed to the gills with official items of interest. They're available to anyone who knows how to get at them and are absolutely free, to boot. They're Apple's ftp server and Higher Education Gopher server, and they can be accessed only via the Internet.

Into the Internet

If you can get onto the Internet (either through a university, business, or government installation or through a local public-access UNIX system; ask a local BBS for information on what systems are near you), merely type `ftp ftp.apple.com`. Then type `anonymous` when asked for a user name and your Internet address when asked for a password, and you'll be granted access to files containing, among other things, every Apple technical note published, most of Apple's public standards, electronic editions of many Apple and non-Apple publications, and copies of every noncommercial piece of Apple software (such as printer drivers, AppleScript and Newton examples and demos, system enablers, and all current versions of the system software except for 7.1 and up). You can download all these treasures free. Of course, there is a hitch: If you've never used ftp before, you'll have to go out and find someone who can give you a basic education on UNIX file transfers.

Apple's Higher Education Gopher server is quite a bit friendlier. Just type `gopher info.hed.apple.com` from your Internet connection, and nigh instantly, you'll be presented with a friendly menu of Apple informational files, ranging from tips and tricks for the Newton to tech info and press releases on everything Apple's working on, including Macs, Newtons, PowerPC, and various hardware and software products. The server also acts as a friendly front end to remote file servers containing hundreds of megabytes' worth of public-domain software and shareware.

Both of these sites are eminently browsable and contain so much valuable information and software that there's certain to be something you'll find essential in them. If you don't have access to the Internet, get it. These two entities alone are well worth the exorbitant usage rate (a dollar an hour) that most independent Internet hosts charge.

Finally, remember that your friendly neighborhood consumer columnist always welcomes your electronic correspondence. Send questions, ideas, and illegal insider information to me at 72511,204 (CompuServe), andyi (AOL), andy (AppleLink) or andyi@world.std.com (Internet).

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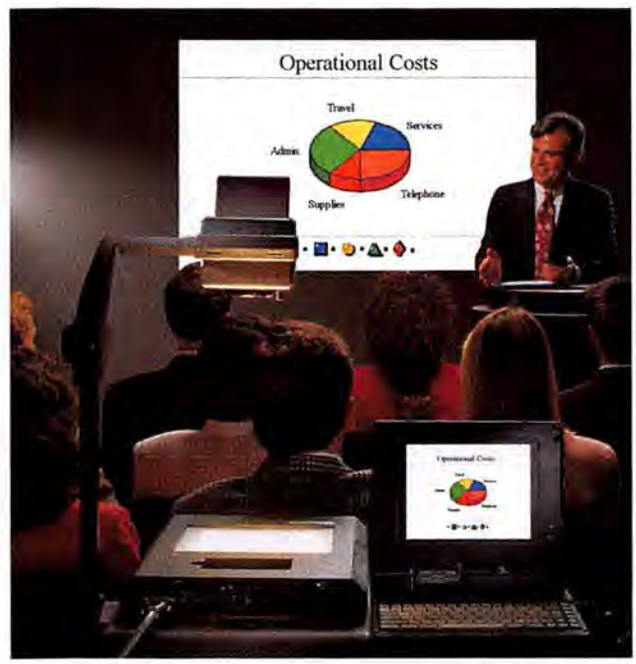

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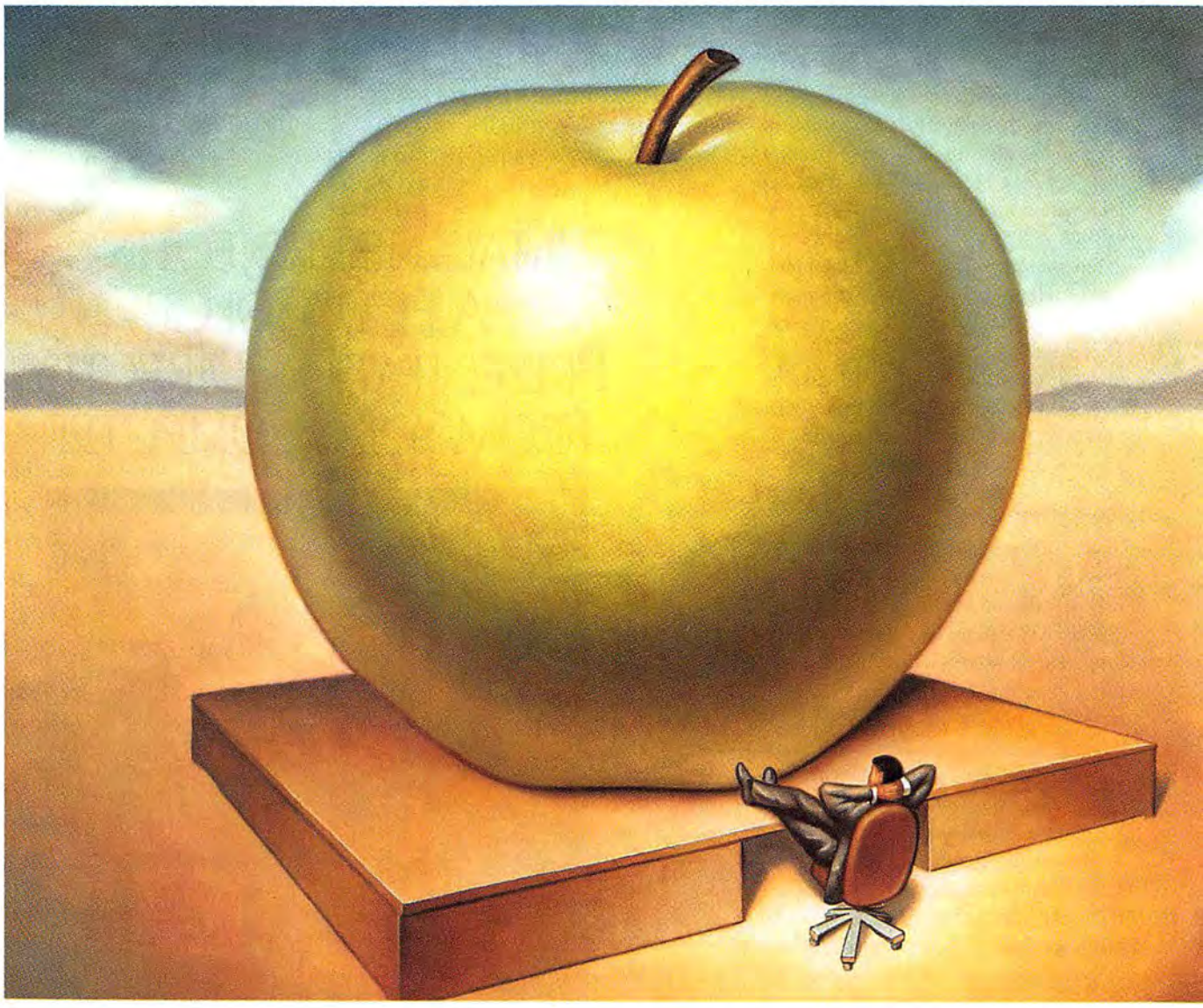

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MICHAEL SWAINE

That Giant Sucking Sound

I JUST LOVE IT. THE BIG BRAINS AT Apple are going to license the Macintosh operating system. See, they are going to allow other personal-computer manufacturers to use significant portions of the operating system, including the Mac's precious graphical user interface. In 1994, God bless 'em.

Now. What does this mean to you and me? It's very simple, folks. It's all about choice.

If they're not just throwing up a lot of gorilla dust, you're going to see something you've never seen before in this market. It's going to be Windows versus Mac. Head to head, no place to run, no place to hide, and may the best GUI win.

It's been ten years, folks, and in all that time you've never had that clear choice. It's always been mixed up with hardware prices and the single-source problem. See, now you get to decide.

Now. Because everybody knows the Mac GUI is better, Apple will be the clear winner, right?

If you believe that, I've got a lot of stuff in the attic I can sell you.

Now, stay with me. By rights, this choice ought to be a no-brainer. After ten years, the whiz kids up at Microsoft still think DEVICE=C:\PRSPF.SYS /T1=3H is a user interface. You want to part your hair, you've got to edit your WIN.INI file. Let's stop and look at reality for just a minute. Windows? That thing is just a pretty patch on a 1970s-era operating system that was written for wireheads.

Bill Gates and company just don't get it, folks.

Now. Let's look at the Newton.

You invent a new category of electronic product for a new market, and guess what? You need to put a new kind of user interface on that sucker. You can't put a garage door on a pup tent, folks, it's just that simple.

Now, some fine folks down in Fort Worth have got a pup tent they call the Zoomer. They think this thing is comparable to Apple's Newton MessagePad, but they're wrong, for a very simple reason. They put a garage door on it! Now, follow me on this. GeoWorks is a fine desktop-computer operating system. But I don't care how fine a desktop-computer operating system GeoWorks is — Zoomer is not a desktop computer. This is not rocket science, folks.

Those good old boys at Tandy just don't get it.

I'm here to tell you that Apple has a better user interface, it has a better operating system for most users, it has lower long-term support costs, and — finally — it has competitive hardware prices.

Now you're probably asking yourself: Mike, if Apple is so smart, why am I hearing this giant sucking sound of customers and developers going over to Windows?

I've got one simple answer: the computer press.

Fly Specks

One of the weeklies — I won't embarrass them by mentioning their name — did a comparison between Macs and PCs last year. Now, this was the biggest load of silly putty I've ever seen. First thing, they counted training requirements as, if I read their figures right, three-tenths of one percent of the total score, which in straight talk is fly specks. You show me the business user who thinks training costs are fly specks. Second, they said their survey results were "not strictly scientific." Now, that's like saying "not entirely pregnant."

These geniuses just don't get it.

Sure, Apple eventually responded to the review, but by then, you know, the horse was out of the barn and the lemmings were on the march.

Microsoft?

1. **They have a plan.**
2. **They understand it.**
3. **They communicate it.**

Why can't Apple?

Now, these computer journalists are not stupid. What I mean is, they know how to read. And those PR people at Microsoft know how to supply them with lots of reading matter. I'm going to let you in on a little secret: If you read enough stuff, sooner or later you're going to start thinking that some of that stuff rattling around in your head is your own brilliant insight. See, Microsoft figured that out.

Now, let's look at Microsoft: No. 1, Microsoft has a plan. No. 2, they understand it. No. 3, they communicate it. Wouldn't you think Apple could get one of those right?

I'm going to make this as simple as I can. Apple, you might as well forget about the information highway if you can't get out of the driveway; you'll get there faster if the driver knows where you're going; and the other drivers are not going to toot your horn for you. It's just that simple.

John Sculley didn't get it. Maybe Michael Spindler will.

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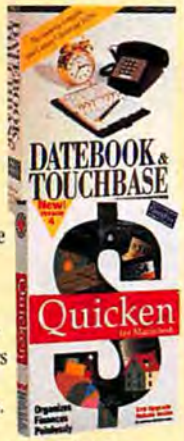

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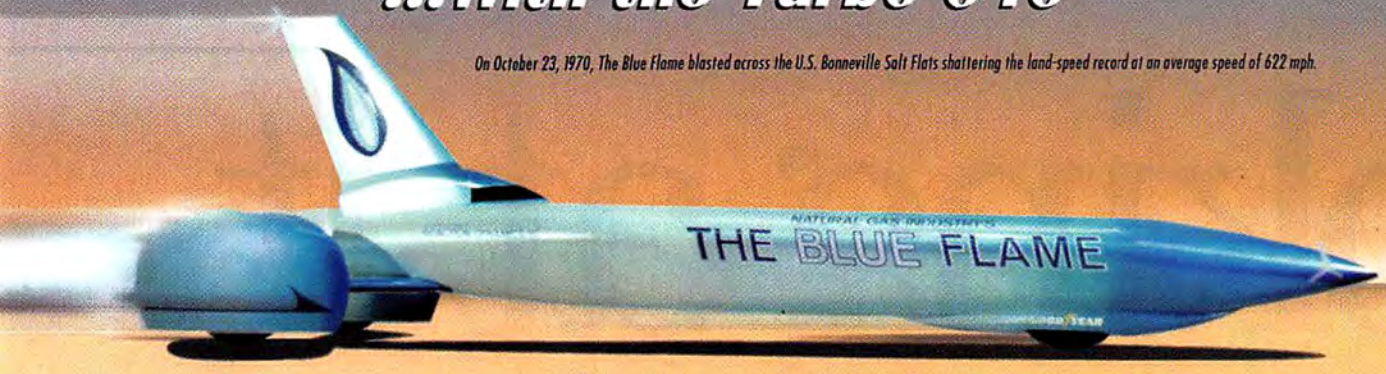

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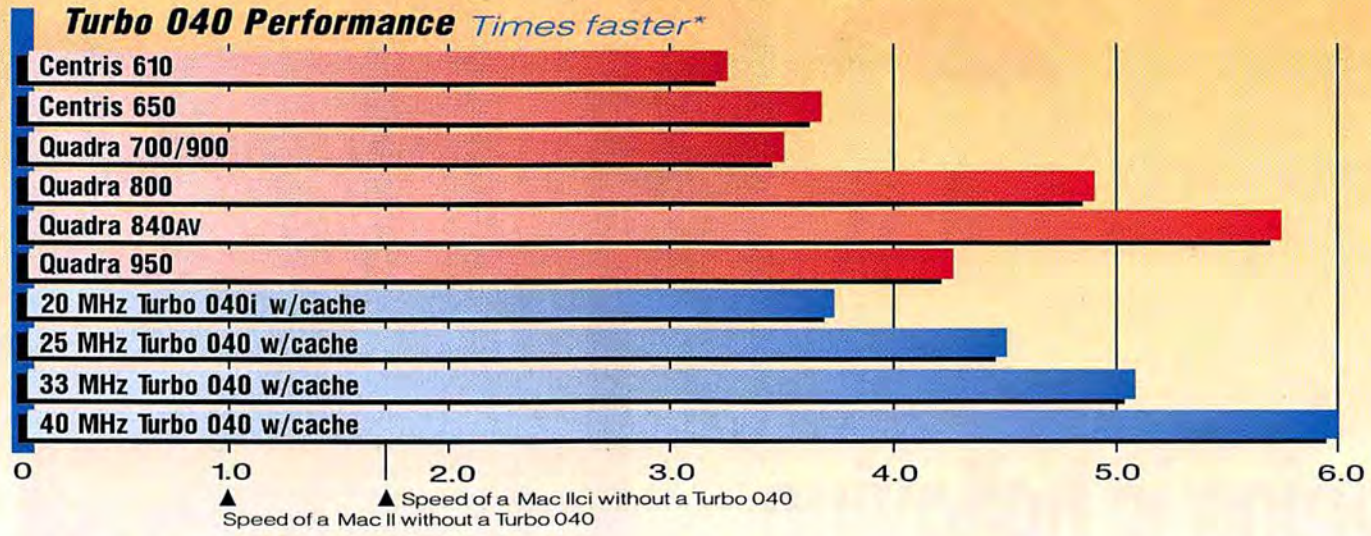

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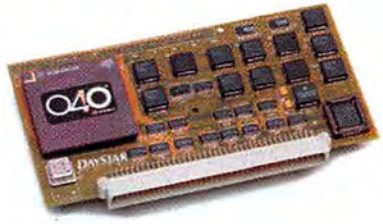

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NEW ON THE MENU

BUSINESS TOOLS /

MICROSOFT UNLEASHES SWIFT NEW RELATIONAL-DATABASE PROGRAM

The long-awaited FoxPro 2.5 for Macintosh heads for high ground. BY DAVID BEAVER

IT WAS ONLY A MATTER OF TIME before Microsoft launched its assault on the Mac relational-database market. FoxPro 2.5 for Macintosh hits the high end, while courting mainstream business users, with a streamlined interface and aggressive pricing.

FoxPro 2.5 for the Mac replaces the aging FoxBASE+, a product that has been outpaced by Microsoft's cutting-edge DOS and Windows database products. The Mac version not only shares features and core technologies with its PC-based siblings but it also offers complete cross-platform compatibility with DOS and Windows (and someday UNIX) systems. Above all, it's fast and cheap — $495, with unlimited distribution of run-time modules available for only another $495.

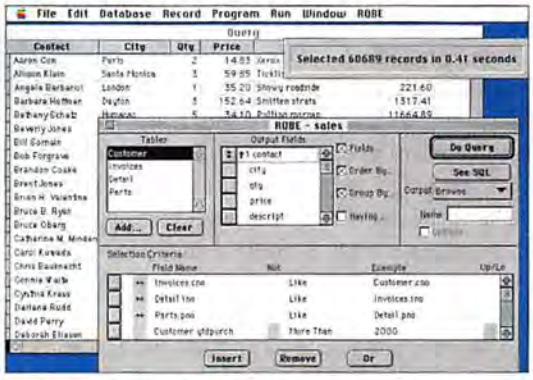
FoxPro for Macintosh operates much like its predecessor, but new features make it a bit easier to use. It provides a powerful new Query editor for data search; improved Report Writer and Label Writer tools; and new Wizard tools, which automatically generate simple screen layouts. All these tools lower the learning curve and make it possible to work effectively without learning FoxPro programming.

Many features target high-end FoxPro-application developers. New graphical editing tools for screens, reports, and menus let developers generate FoxPro programs that are usable right away, without the manual tweaking required in the past. The new Project Manager utility helps manage all the screens and programs that comprise a FoxPro database and can compile them all into one desktop file for distribution to users.

FoxPro 2.5 for Macintosh also includes the database-engine technology from the PC versions, providing better performance than did FoxBASE+. The previous version's limits on the number of open files and indexes have been lifted, and Microsoft claims its patented Rushmore search-optimization logic provides much faster database access than was possible with FoxBASE+, historically the speediest database program for the Mac.

Microsoft put a lot of effort into FoxPro's cross-platform capabilities. Provided tools help deal with complex issues of moving data — such as fonts, character sets, and filenames — across platforms, and sophisticated FoxPro databases can move from the Mac to a PC and back without much trouble. Naturally, the features particular to one operating system don't port cleanly to another, and FoxPro does support Mac-only features such as Apple events and QuickTime.

FoxPro is very complex. It won't replace FileMaker at the low end of the Macintosh market, but at the high end, its speed, cross-platform features, and rock-bottom pricing could give ACI US' 4th Dimension and Blyth Software's Omnis 7 serious competition. Upgrades from FoxBASE+ for Macintosh are $149 until April 1994 and $199 thereafter. 206-882-8080.



FoxPro 2.5 for Macintosh includes query tools that speed data search, thanks to its Rushmore technology.

STORAGE TRENDS /

Hard Drives Hit New Levels of Capacity and Performance

MAYBE, SOME YEAR, the rate of increase in hard-drive capacities will slow down, but 1994 won't be that year. In a spate of announcements over recent months, manufacturers have disclosed plans for new mechanisms that have room for mind-boggling amounts of data.

Seagate Technology laid claim to the overall lead in SCSI-device capacity with the Elite 9, a new 5.25-inch mechanism that has a formatted capacity of 9 gigabytes — the equivalent of more than 6,300 high-density floppies. Digital Equipment, meanwhile, moved to the front of the pack in the 3.5-inch-mechanism race with one that holds 4.3 gigabytes. It also announced a 1-inch-high version whose formatted capacity is 2.15 gigabytes. Quantum, Apple's chief mechanism supplier, hasn't been known as a capacity leader, but it's not far behind Digital, having added a 2.1-gigabyte standard-height mechanism and a 1.44-gigabyte low-profile unit to its 3.5-inch Empire line.

Even PowerBook users will soon be able to carry around half a gigabyte of data: Toshiba, Fujitsu, and Quantum each plan low-power, 2.5-inch mechanisms that will hold more than 500 megabytes each.

Besides increasing capacity, manufacturers keep improving reliability too. Digital's new mechanisms carry an MTBF (mean time between failures) rating of 800,000 hours (about 91 years); the other new-generation devices don't quite match that, but with MTBFs of 300,000 to 500,000 hours, they're likely to outlast your Mac. Some of these high-capacity mechanisms are scheduled to go into volume production this quarter, and all should be available by midyear. Check with your storage vendor about availability and price. / Henry Norr

NEW CPUS /

THIS MAC DOES DOS

Dual-platform Quadra gives users access to both worlds. BY JAMES BRADBURY

APPLE COMPUTER ISN'T EXACTLY PLUNGING into the PC-clone market, but with the company's recent Comdex announcement of a product "under development," it comes close. The Quadra 610, DOS Compatible, expected to ship in the first half of 1994, will be the first Mac with (shudder) an Intel microprocessor under the hood (on a 68040 PDS expansion card) and MS-DOS (version 6.2) preinstalled on the hard disk.

Of course, the dual-duty machine will still have all the Mac functionality of a Quadra 610, for about $500 more than comparable Mac-only Quadra 610s, which start at about $1,400. Apple said it also plans to sell the daughterboard as a separate 68040 PDS card, for approximately $500.

With a 68LC040 processor on the motherboard and a 25-megahertz 486SX on the daughterboard, the Quadra 610, DOS Compatible, won't exactly qualify as a high-end screamer in either its Mac or PC incarnations. But it will be able to run Windows (which Apple won't be licensing, although dealers may decide to include it in bundles), and it promises unprecedented seamless integration between the Mac and PC environments.

The machine's feature set should appeal to people who wish to keep one foot in the DOS world but want to upgrade to a GUI other than Windows. A keyboard toggle will switch between the Mac and PC environments. If two monitors are connected to the machine, the Mac desktop will appear on one monitor and the DOS screen will appear on the other, with both able to process concurrently. The PC Setup control panel will let users configure parameters such as the size of the PC "drive container" file, where DOS files are stored, and the mapping of PC COM and printer ports to the Mac's serial ports. The bundled PC/Exchange software will mount and recognize DOS floppy disks and files. Conversely, the PC will recognize Mac folders as PC drives.

Cutting and pasting between the Windows and Mac Clipboards will be supported. The daughterboard has two SIMM slots for adding memory directly to the DOS side as well as a chip set built in that will support VGA and SVGA resolutions as high as 800 x 600 pixels. There'll even be a game port for a joystick included as part of the monitor cabling.

What's the catch? Apple acknowledges two limitations: The machine won't support PC networking, which severely limits its usefulness in corporate settings. And the PC won't be able to reproduce multimedia-type audio that requires a sound card on PCs — a capability that's built in to all Macs. Should the Quadra 610, DOS Compatible, be a hit with the small-business, home-office, and education/training users Apple is targeting, perhaps a more powerful version might follow. Most likely, though, Apple will wait to see whether software emulators under development by Insignia Solutions will run fast enough on the coming PowerPC Macs to render cross-platform hardware unnecessary. 408-996-1010.

WORD OF MOUTH

"WE STRAYED AWAY from our commitment to publishing to be accepted more broadly. But publishing is a $13-billion-a-year market. I'd like to see a few more of those niches." / Michael Spindler, Apple Computer's president and CEO, on why Apple decided to form the Worldwide Publishing Consortium (WWPC) to promote Macs in the publishing arena

"IT'S BEEN NINE YEARS, ten months, and forty-three minutes since anyone at the senior level of Apple paid any attention to the publishing market." / Paul Brainerd, Aldus Corporation's president and CEO, at the WWPC announcement

"FOR THE PUBLISHING INDUSTRY, this is good news, but the really good news is that Michael Spindler is running Apple." / John Warnock, Adobe Systems' CEO, at the WWPC announcement

GRAPHICS TREND /

JVC'S BREAKTHROUGH IN IMAGE PROCESSING

PROVING ONCE AGAIN THAT THE MAC is a viable platform for high-end imaging, JVC Laboratories of America is developing Pixelens, an image-processing application that brings patented object-oriented features from the workstation world to the Mac.

The Mac has been a fertile area for innovation in image processing recently, as is evident in HSC Software's Live Picture, for instance. Pixelens continues that trend by giving Mac users capabilities similar to those available with such high-end systems as the Linotype DaVinci.

Shown to *MacUser* in a sneak preview, Pixelens is built around a lens metaphor. The lens acts like a selection area or mask in Photoshop but stores in a database every operation done to that selection area. At will, the artist can jump to any operation, such as applying a filter or adding a brush stroke, and modify or remove an action. Text can act as a lens too, yet it remains fully editable as text. This is unlimited undo on steroids.

Pixelens should be available during the first quarter of 1994, for less than $1,000. / Sean Safreed

POWERPC UPDATE / BY STEPHAN SOMOGYI

POWERPC GETS FASTER AND CHEAPER — EVEN BEFORE IT SHIPS

Microsoft jumps on the PowerPC bandwagon.

IF YOU THOUGHT THINGS WOULD stay quiet until the first PowerPC-based Macs ship this spring, think again. IBM Microelectronics announced an 80-megahertz version of the PowerPC 601 chip that should be available in production quantities by the time you read this. Apple then promptly announced that it will ship PowerPC Macs based on the new 80-megahertz chip during 1994. On top of that, Apple also said that the minimum speed of the 601 in the first PowerPC Macs will be 60 megahertz, rather than 50 megahertz, as originally stated — that's a 20-percent boost before the product even ships.

On the new-technology front, the three members of the PowerPC alliance — Apple, IBM, and Motorola — announced the PowerPC 603 chip in late October. The 603 had several design goals: low cost, high-volume production, and low power consumption. Although the PowerPC 601 is the one that'll be in the first generation of PowerPC Macs, the 603 will wind up in the low-cost part of the product line, and because of its power-miserly features, the 603 will be the PowerPC chip for PowerBooks.

The upgrade situation is looking brighter too. For the first time, Apple said that upgrade kits for the Centris, Quadra, and other 680x0 Macs for which upgrade paths were previously announced would be available as soon as the PowerPC machines ship. Current Mac users won't have to wait while other guys on

the block play with their new machines. Even better, the prices of upgrade kits are expected to start at less than $1,000.

Shipping of the first PowerPC products is still set for quarter 1. "We won't put one machine in CompUSA on June 30 and say it's shipping," said the PowerPC product manager, Jim Gable, at an industry conference. "By June, you'll all be using these machines."

All this is well and good, but what users want to know is how fast their applications will run on a PowerPC Mac. That question was answered at the fall Seybold publishing conference, where vendors showed several graphics applications running in native PowerPC mode. Adobe Photoshop, Aldus FreeHand, Specular International's Infini-D, Fractal Design's Painter, and ITEDO Software's IsoDraw (a technical-illustration package) took the stage, running side by side on a Quadra 700 and on a prototype PowerPC Mac. The PowerPC Mac ran circles around the Quadra 700. Painter's code name (X3) said it all — PowerPC applications were on average three times as fast as those on the Quadra.

And for all the doubters who wonder if the PowerPC is just a flash in the pan, consider this: Microsoft announced that it will sell a PowerPC version of Windows NT, its high-end operating system. Motorola and IBM are doing the work of porting Windows NT to the PowerPC, but Microsoft will sell the PowerPC version of Windows NT under its own label.

Building a Better Keyboard

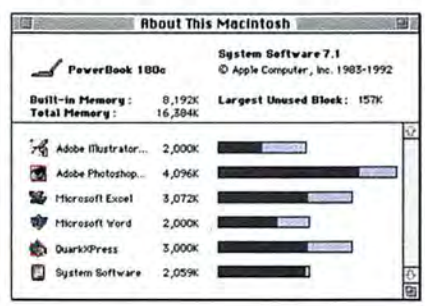
Ergonomic, colorful, and modular — that's the goal of the TrackBoard, a new keyboard from MicroMachines. Taking a cue from the PowerBook, the compact TrackBoard (shown in a prototype below) sports a built-in trackball, a thumb bar, and keys for drag and double-click. But like an extended keyboard, the TrackBoard has function, Escape, and reset keys. Desktop-space hogs, such as a numeric keypad, are optional.

You can customize the TrackBoard according to function or whim. Flipping a DIP switch sets which key on the trackball unit is drag and which is double-click or lets you change the right-hand Command key to an Enter key. Dual-function arrow keys also serve as Page Up, Page Down, Home, or End keys. As for whimsy, the unit is sold in platinum and in charcoal gray and the provided key-cap puller lets you colorize your keyboard for easier recognition of critical keys. The TrackBoard is expected to sell for $100 street. Options include a numeric keypad ($49), a wrist rest ($15), and a carrying case ($30). 800-248-4001 or 818-901-1700. / Pamela Pfiffner

WHAM BAM, DOUBLE YOUR RAM

FEELING CRUNCHED BY RAM LIMITATIONS? RAM Doubler, from Connectix, effectively doubles the amount of RAM in your Mac without touching your hard disk. Drop the RAM Doubler extension into your System Folder, and, Connectix says, your 8 megabytes of RAM become 16 megabytes.

RAM Doubler works by analyzing an application's memory usage and then compressing unused portions. As a result, RAM Doubler is most effective when you're using multiple applications. Its low power requirements make it handy for PowerBook users too.



Costing $99, RAM Doubler requires a 68030 or more powerful Mac, 4 megabytes of RAM, and System 7 (a System 6 version should be available soon). 415-571-5100. / Pamela Pfiffner

PRESENTATION SOFTWARE /

COMING TO A SCREEN NEAR YOU: ALDUS PERSUASION 3.0

Easy interface, extensive charting mark new release. BY PAMELA PFIFFNER

ALDUS HAS BEEN watching Microsoft PowerPoint eat away at its share of the presentation market. Aldus Persuasion 3.0 answers that sally with a strong charting module, better color handling, beefed-up options for on-screen presentations, and a greatly improved interface.

Opening Persuasion places you in Slide view — an indication of the work Aldus has done to make the program easier to use — complete with guided instructions for creating a new

presentation. Borrowing heavily from PageMaker and FreeHand, Persuasion now has floating toolboxes and palettes as well as a movable 0 point. New icons allow you to navigate various views quickly. Thumbnail windows are available for previewing effects.

For precise placement of text and graphics, Persuasion gives you 80 ruler guides per slide as well as nudge and alignment controls. It (finally) supports automatic kerning.

Praise has been heaped on PowerPoint's WYSIWYG Outline view, and Persuasion responds with outlining, built-in word processing, on-screen annotation, automatic generation of speaker notes and handouts, and more.

Persuasion's layering and master-slide handling have been strong suits. The new version builds on these with the ability to apply transitions to each layer on a slide and time each effect individually. A feature called Reapply Master lets you experiment with many effects and then revert selectively to the last setup. The new slide sorter lets you drag and drop slides into place, and Persuasion updates page numbering, branching, and so on.

Persuasion ships with the Aldus Chart module, which gives you 84 chart types and many more ways to modify them. You can, for instance, make pie-chart slices fatter or apply perspective to a bar chart. Support for OLE 1.0 links Aldus Chart to Excel and other OLE-savvy apps.

Improved color handling gives you 256 colors per slide, and color palettes are optimized for better on-screen presentations on 8-bit systems. You can also preview in gray scale to see what your presentation will look like when it's printed as a black-and-white handout.

The shored-up cross-platform compatibility of Persuasion includes support for QuickTime for the Mac and Windows machines and support for Video for Windows. You can also play a run-time presentation on either system with Persuasion Player. 206-622-5500. $495.

Seiko Printer Does Both Dye-Sub and Thermal-Wax

Dye-sublimation printers are getting more affordable, but they're still pricey compared to thermal-wax models. Granted, owning one of each is pretty extravagant, but Seiko Instruments USA has made it more possible to have both — in the same unit.

The Professional ColorPoint 2 PSF, Model 14, offers both dye-sub and thermal-wax printing from the same box. Fargo Electronics sells the Primera, a dual unit, for about $1,500, but unlike the Primera, the Seiko unit uses an Adobe PostScript Level 2 interpreter, offers 300-dpi resolution, and accepts tabloid paper. At $16,499, it costs more too.

To switch between modes, you lift out a ribbon and replace it with another. Seiko says that the printer reads sensors between the color panes and advances the ribbon to the correct one. We suspect that users will configure the printer for one mode and only occasionally use the other. Three-color (CMY) and four-color (CMYK) ribbons are available. The per-page cost for tabloid paper ranges from $1 for CMY thermal-wax output to $8 for CMYK dye-sub output.

Another feature of this split-personality printer is Automatic Media Sensing, which detects which ribbon is loaded and reconfigures the printer accordingly. For better gripping by the paper tractor, Seiko supplies extra-long tabloid paper. A built-in paper cutter automatically trims the paper ends.

It ships with a 33-megahertz Intel RISC processor and 24 megabytes of RAM. Of its 104 fonts, 65 are on the bundled 160-megabyte hard drive. 408-922-5800. / Pamela Pfiffner

CD-ROM /

BOOK TO THE FUTURE

BOOKS ON DISK have been around a while, but Electric Science Fiction: Hugo and Nebula Anthology goes worlds beyond the usual. This CD-ROM from ClariNet Communications contains *five* complete novels as well as numerous short stories and art that were nominated for either Hugo or Nebula awards. At $29.95, it's the best deal in electronic books. Because the anthology was assembled in short order so that SF fans could read nominated works before casting award ballots, some manuscripts went directly from their authors' computers to the CD-ROM. So download a novel to your laptop, and find out just how good your favorite author's spelling actually is. 408-296-0366. / James Bradbury

SOFTWARE TRENDS /

MICROSOFT READIES CROSS-APPLICATION OPERABILITY

Object Linking and Embedding 2.0 will integrate Microsoft Office programs and more. BY HENRY NORR

NEW VERSIONS OF three best-selling Microsoft applications for the Mac are due this quarter, and they may mark a major milestone along the way to a new style of computing.

Word 6.0, Excel 5.0, and PowerPoint 4.0 will share core code, features, file formats, version numbers, and even manuals with their Windows counterparts. Each promises to have a slew of enhancements, with a particular focus on simplifying complex tasks and automating routine work. (Microsoft's marketeers came up with IntelliSense as a catchall label for these ease-of-use features.) But the most significant innovation in the new programs is a Microsoft technology with the ungainly name of Object Linking and Embedding, version 2.0 — OLE 2.0, for short.

In its simplest form, OLE will give you a new way to move information from document to document: Instead of copying and pasting, you can drag and drop text, graphics, and even spreadsheet data from one window to another in any program — as long as the developers have implemented OLE 2.0.

Another aspect of the technology, called OLE Automation, allows one application to control another. Excel 5.0 will include Visual Basic Applications (VBA) Edition, a scripting system based on Microsoft's popular Visual Basic programming environment for Windows. With VBA, you will be able to write scripts that automate not only Excel but also Word and other OLE 2.0-compatible applications; you'll be able to launch VBA scripts with AppleScript, and vice versa. (Word 6.0 won't have VBA — that's slated for a later version, Microsoft says — but it will have a macro language called WordBasic.)

OLE 2.0 will let users access and edit Excel 5.0 spreadsheets from within Word 6.0, as shown in this Word for Windows document.

OLE 2.0's paradigm-shifting potential lies in a feature Microsoft calls Visual Editing, which provides a streamlined way to work with different kinds of data within a single document.

Suppose you want to include a mini-spreadsheet in a report you're writing in Word. Currently, you have to leave Word, launch Excel, and enter your data and then copy, export, or publish it to Word. With Word 6.0, all you'll have to do is go to the standard Word tool bar, click on the spreadsheet icon, and drag out a box of any size. Assuming Excel is loaded on your Mac, a blank worksheet will appear right inside your Word document and Excel will take over the menu bar; all of its functions and features will be available. When you want to go back to writing prose, you'll just click elsewhere in the document and Word's menus will reappear.

The whole industry is moving toward this "document centered" approach. Apple has proposed an equivalent to OLE 2.0, called OpenDoc, which has won endorsements from IBM and other firms. (Apple promises that OpenDoc will be interoperable with OLE 2.0, so you should be able to embed objects from programs that implement the Microsoft approach into OpenDoc files, and vice versa.)

Apple says its technology offers numerous advantages, not least the fact that it won't be controlled by Bill Gates. But Microsoft is ahead for now, and given the dominance of Word, Excel, and PowerPoint in the Mac marketplace, expect to see many other programs adding support for OLE 2.0.

ZMAC UTILITY OF THE MONTH

CLEAN UP YOUR HARD DISK

A KILOBYTE HERE, 500K THERE. If you got rid of all the unattached aliases and duplicate copies of TeachText on your hard disk, you'd free up a lot of space. But who has the time to search folders on a regular basis? Clean Sweep, this month's utility from *MacUser* and ZiffNet/Mac, does just that for users of System 6 and 7.

Clean Sweep scans your hard disk for unwanted files, and it's intelligent: It knows that Word temp files aren't temporary and that empty folders are just that, yet it won't delete them without your go-ahead. It looks for a variety of file types, such as duplicate files or applications, preferences files for absent applications, and all temp files.

Clean Sweep is available exclusively on ZiffNet/Mac and from the ZiffNet Selections area on AppleLink. It was written by Robert Gibson (72511,345). ZiffNet/Mac members can download Clean Sweep free of connect-time charges until January 25, 1994, by typing GO MACUTIL. After that, you can find the file CLNSWP.SIT in Library 3 of the MacUser Forum (GO MACUSER). If you're on AppleLink, look for Clean Sweep in ZiffNet Selections:MacUser Software:Utilities. / Shef Syed

It's ALLright for ...

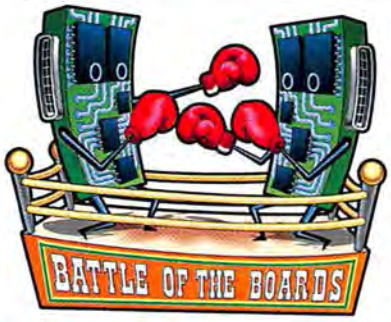
ALLright is a slick bundle of utilities that lets you manage extensions, menus, folders, and sounds; make macros; select printers; copy files; and even attach digital sticky notes to documents — all from a central tool bar and within any application, according to its developer, MSA. ALLright installs as a single system extension that has nine plug-in control-panel modules, including COPYright, MSA's file- and folder-copying utility. 412-471-7170. $129. / Pamela Pfiffner

GRAPHICS ACCELERATORS /

ROBUST RAM, QUICKER DRAW MARK NEXT BATCH OF VIDEO CARDS

RASTEROPS AND SUPERMAC box another round in the fight for QuickDraw acceleration. Both companies released 24-bit, super-accelerated, multifunction, DSP-laden graphics cards that should shorten the time graphics artists and desktop publishers spend tapping their toes.

RasterOps' Horizon 24 video card and DSP daughtercard target big images. With a 128-bit-wide data path (as opposed to the standard 32-bit) and as much as 256 megabytes of RAM on-board, the Horizon 24 can store and process huge amounts of image data quickly.



The Horizon DSP daughtercard features twin 66-megahertz DSPs (identical to the ones used in the Quadra 840AV) and 256K of high-speed static RAM, which accelerates the conversion of data from RGB to CMYK. It also ships with a slew of Adobe Photoshop filters for boosting functions such as Unsharp Mask and more. The Horizon 24 is also compliant with ARTA (Apple Real Time Architecture), for accelerating 3-D modeling, animation, and QuickTime editing. Resolutions as high as 1,200 x 1,024 pixels are supported.

All this speed comes at a price, however. The 4-megabyte Horizon 24 with DSP costs $4,999, the 16-megabyte model is $5,999, and the 64-megabyte model will set you back $13,999. 408-562-4200.

SuperMac's Thunder II GX•1360 represents the next generation of SuperMac's Thunder family. It features the very latest QuickDraw-acceleration technology from SuperMac and adds support for resolutions as high as a whopping 1,360 x 1,024 pixels. This combination makes for fast scrolling on large screens.

Prepress professionals will appreciate the Thunder II GX•1360's use of ASIC (application-specific integrated circuit) technology to speed up CMYK-to-RGB conversion. Because it accelerates on the fly how CMYK data is displayed on-screen, working directly in CMYK is much faster.

It's not just with Photoshop that you notice the difference in speed, however. The Thunder II GX•1360 integrates SuperMac's DSP technology, which provides acceleration for Kodak's Photo CD Acquire, Storm Technology's PicturePress, and Apple's new PhotoFlash. 408-541-6100. $4,499. / Jeff Pittelkau

LEGALESE OF THE MONTH

"WE'RE GOING TO SPARE you all of the license agreement bull----. However, we'd like to remind you that these typefaces are the result of a lot of hard work and it would be really lame if they were haphazardly given out to anyone and everyone. Use the fonts, enjoy them, but tell the dude (or chick — this is the nineties) who wants you to hook him/her up to buy their own. Thanks." / House Type font-collection user agreement, House Industries; 302-888-1218

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects national sales activity for the new and secondary Mac market as of November 8, 1993. Prices do not include a monitor or a keyboard. New prices represent the average discount selling price of current models. The United Computer Exchange is a national clearinghouse for buyers and sellers of used microcomputer equipment. For more information, contact the United Computer Exchange at 800-755-3033 or 404-612-1205.

Mac Model	New	Used
Plus (1/20)	•	$325
SE (2/20)	•	$400
SE/30 (4/40)	•	$700
Classic (4/40)	•	$550
Classic II (4/40)	•	$600
Color Classic (4/80)	$1,069	$925
LC (2/40)	•	$450
LC II (4/40)	•	$550
LC III (4/80)	$799	$675
II (5/40)	•	$450
IIsi (5/80)	•	$850
IIx (5/80)	•	$800
IIcx (5/80)	•	$550
IIci (5/80)	•	$1,100
IIfx (5/80)	•	$1,450
IIvx (4/80)	•	$950
Centris 610 (4/80)	•	$1,050
Centris 650 (8/230)	•	$1,675
Quadra 605 (4/80)	$949	$850
Quadra 610 (8/160)	$1,399	$1,250
Quadra 650 (8/230)	$2,349	$2,150
Quadra 700 (5/230)	•	$1,350
Quadra 800 (8/230)	$3,197	$2,750
Quadra 660AV (8/230)	$2,299	$2,125
Quadra 840AV (8/230)	$3,549	$3,275
Quadra 900 (5/230)	•	$2,200
Quadra 950 (8/230)	$3,999	$3,250
Portable (1/40)	•	$375
PowerBook 100 (4/20)	•	$700
PowerBook 140 (4/40)	•	$925
PowerBook 145 (4/40)	•	$1,050
PowerBook 145B (4/40)	$1,349	$1,150
PowerBook 160 (4/40)	•	$1,375
PowerBook 165 (4/80)	$1,699	$1,525
PowerBook 165c (4/80)	$1,769	$1,525
PowerBook 170 (4/80)	•	$1,600
PowerBook 180 (4/80)	$2,199	$1,875
PowerBook 180c (4/80)	$2,549	$2,275
PowerBook Duo 210 (4/80)	•	$1,100
PowerBook Duo 230 (4/120)	$1,529	$1,275
PowerBook Duo 250 (4/200)	$2,589	$2,375
PowerBook Duo 270c (4/240)	$3,097	$2,875

• = discontinued model

With MacWrite Pro

you can do all the things you can do with competing programs, except for spending a whole lot of money. Yes, this happens to be a wordy headline, but then again, this program's so simple to use, it's easy to get carried away. And when you get carried away, you tend to ramble on with complete disreg

Here it is in a nutshell: for merely half the price of most other programs, MacWrite® Pro 1.5 brings you all the features and capabilities you need in a word processing program. (In a smaller nutshell, it's "value.")

With text, tool and style palettes, the things you do most often are just a mouse click away. Create tables and integrate graphics with nary a sweat drop on your unfurrowed brow. Once you get up to speed (which shouldn't take too long, given the intuitive nature of this program) you may want to try the new time-saving table of contents feature. Or set up multiple columns of varying widths. Or take advantage of the features of Apple® System 7 Pro. There's QuickTime,™ AppleScript™ and PowerTalk,™ which lets you send messages to others without even leaving the document you're working on.

We've got lots more to tell you, but we've run out of space. So call 1-800-544-8554, ext. 261 for more information.

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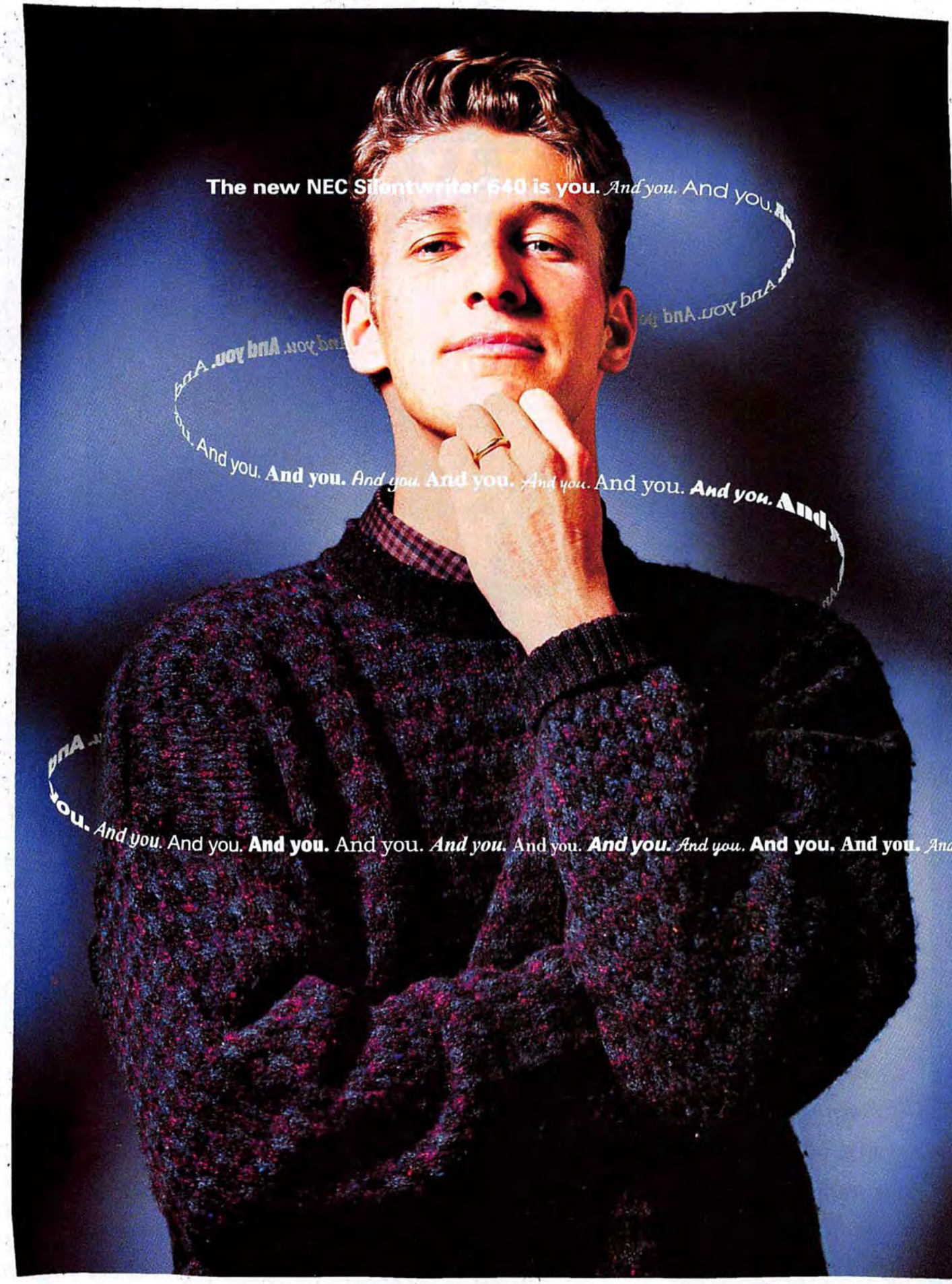
For a limited time, get MacWrite Pro for just $99.* Includes special offer for add-on products.†

*$99 price expires 5/31/94. Not valid with any other offer. †Add-on products include Correct Grammar,™ Dyno NotePad,™ and Micro Expressionist.™ ©1994 Claris Corporation. All rights reserved. Claris and MacWrite Pro are registered trademarks and the MacWrite Pro design and Simply powerful software are trademarks of Claris Corporation. Apple is a registered trademark and QuickTime, AppleScript, and PowerTalk are trademarks of Apple Computer, Inc. All other trademarks are the property of their respective owners.



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Our new personal Mac® laser printer lets you say what you want to say, exactly the way you want to say it. That's because it's a true laser printer with 300 dpi resolution, along with our patented Sharp Edge Technology and Microfine toner, for crisper characters and richer, darker blacks.

And because it comes with 17 resident Adobe™ Type 1 fonts, 35 professional TrueType™ fonts, and built-in TrueType and Type 1 rasterizers.

It's loaded in other ways, as well. It has Adobe PostScript™ Level 2, so it works beautifully with any application. NEC's 6ppm print engine. 3 MB of standard RAM. And an AppleTalk® interface, for quick and easy connectivity with one or several Macs.

It also gives you what no one else does: a 2-year limited warranty that will get you a replacement printer *overnight,* if anything goes wrong. All for about $800.

For more information, call 1-800-NEC-INFO. Or, for information via fax, 1-800-366-0476, and request document #79640. Thank you. And you. And you.

you. And you. **And you.** ***And you.*** And you. ***And you.*** And you. **And you.** *And you.* **And you.** ***And you.*** *And you.*

POSTSCRIPT Software from Adobe

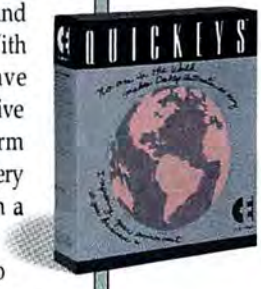
NEC

CIRCLE **116** ON READER SERVICE CARD

"HOW I DISCOVERED QUICKEYS™ AND SAVED THE EARTH"

It all started last June

here at Earth Lovers Landscaping, when I discovered money doesn't grow on trees. So I went digging for ways to save money and make the Earth a better, more profitable place. Which is how I found QuicKeys. With QuicKeys I have replaced repetitive tasks I perform all day – every day – with a single keystroke or a mouse click. QuicKeys allows me to plant lots of time-saving and money-saving shortcuts directly into my business.



MACUSER EDITORS' CHOICE AWARD 1993 FINALIST

"Earth Lovers Landscaping" is a whopping 24 keystrokes. QuicKeys can save one week a year by typing it in just one keystroke.

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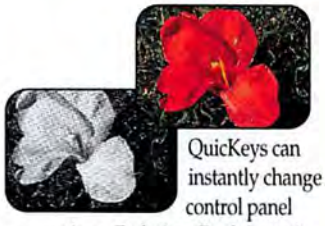

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CIRCLE **25** ON READER SERVICE CARD

HP LaserJet 4MP / Hewlett-Packard delivers energy-efficient 600-dpi printing at a rock-bottom price.

JUST WHEN YOU THOUGHT the prices of PostScript laser printers couldn't drop any lower than they are, Hewlett-Packard delivers a *600-dpi* personal laser printer street-priced at less than $1,500. The HP LaserJet 4MP follows on the heels of HP's 300-dpi LaserJet 4ML, which broke price/performance barriers last year with a street price of less than $1,000. Its new 600-dpi sibling boasts top-notch output as well as similar energy- and toner-saving features.

MacUser Labs

Desktop Space Saver

Measuring 14.9 inches long, 14.7 inches wide, and 6.9 inches high and weighing 20 pounds, the $1,729 LaserJet 4MP is a bit bulkier than the supercompact 300-dpi LaserJet 4ML (see review, September '93, page 68), but it's still small enough to meet the needs of users in homes and offices where space is at a premium.

The overall design of the 4MP differs from that of the 4ML. The 4MP's control panel is located on the front of the printer, rather than on the top. In addition, the new printer comes with a side panel that lets you easily boost memory capacity by adding SIMMs. Out of the box, the 4MP comes with 6 megabytes of memory, but you can increase its capacity to 22 megabytes.

The 4MP also has a power switch, which the 4ML doesn't. The latter features an energy-saving dormant mode, during which it consumes only 5 watts per hour, which helps eliminate the big energy drain that occurs when you power up a printer. Similarly, the 4MP goes into a special rest mode after a period of inactivity, during which it consumes about 12 watts per hour. The 4MP isn't as efficient as the 4ML in this respect, but it still eats up far less energy than most standard laser printers. A 4ML design element that's missing altogether on the new printer is side panels that lock the cable and the power cord firmly in place. That's too bad — the 4MP is almost as easy to slide around as the 4ML, but we experienced some problems keeping the printer cable firmly attached to the 4MP.

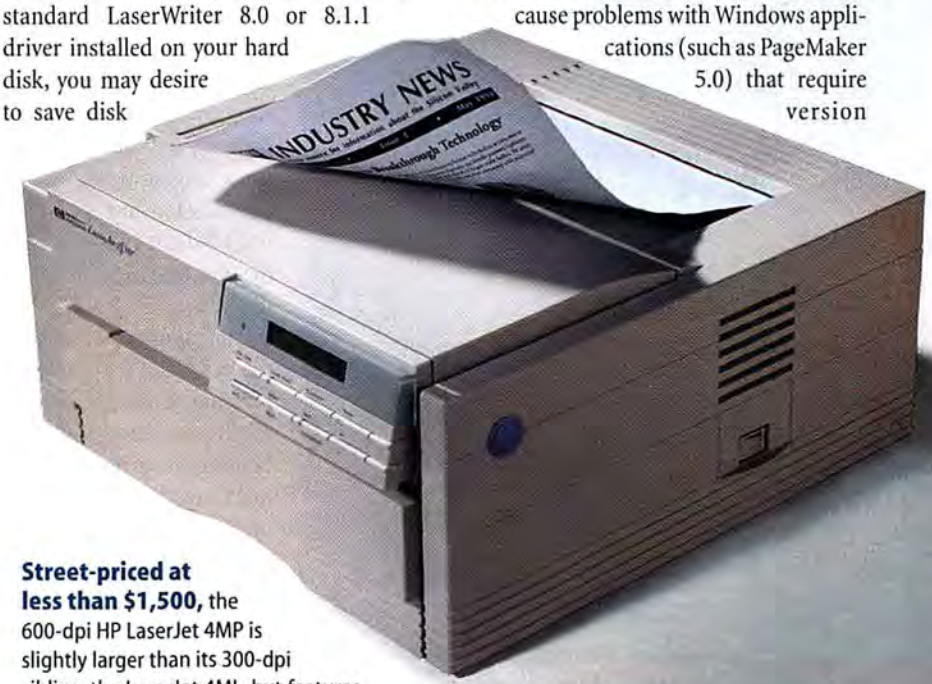
Setting up the LaserJet 4MP is simple. An installer program directs all the printer's software to the proper places on your hard disk. The 4MP's printer driver is the HP equivalent of Apple's LaserWriter 8.0 driver, but it's enhanced with HP-specific help screens. If you already happen to have the standard LaserWriter 8.0 or 8.1.1 driver installed on your hard disk, you may desire to save disk space by choosing between the Apple and the HP drivers (each of which requires about 500K). Installation also adds a PPD (PostScript Printer Description) file. The printer comes with the standard set of 35 Type 1 PostScript fonts for the Macintosh as well as 45 internal PCL fonts for PC print jobs.

Both the HP LaserJet Utility software and the printer's front control panel let you control various aspects of the 4MP, including test pages, selection of internal PCL fonts and ports, resolution (300 dpi or 600 dpi), and the printer's vaunted EconoMode option — a carryover from the 4ML. EconoMode reduces the amount of toner the printer uses by 50 percent but still lets it produce extremely legible output. Although the utility software enables you to control a variety of printer settings with your Mac rather than with the printer's front control panel, an even more convenient arrangement would be to have these settings in the Print dialog box.

The printer also comes with software for Windows machines. The HP Windows PostScript Printer Driver is equivalent to version 3.55 of the Microsoft PostScript Printer Driver. Unfortunately, HP's version may cause problems with Windows applications (such as PageMaker 5.0) that require version

Reviews Rating Key

★★★★★	Outstanding
★★★★	Very Good
★★★	Acceptable
★★	Poor
★	Seriously Flawed
💣	Dangerous



Street-priced at less than $1,500, the 600-dpi HP LaserJet 4MP is slightly larger than its 300-dpi sibling, the LaserJet 4ML, but features similar energy- and toner-saving options.

3.56 of the driver for reliable printing. You can switch to the standard 3.56 driver from Microsoft, but it won't let you control some of the 4MP's special features, including EconoMode. Fortunately, you *can* control these features via the front control panel. The Windows software also includes a set of Type 1 fonts.

The HP LaserJet 4MP garnered a 3-ppm rating in our tests at 600 dpi and met its advertised 4-ppm rating when we used the 300-dpi setting. As you can see from the type samples shown here, the output quality at 300 dpi (left) is nearly identical to that at 600 dpi (right).

The printer comes equipped with three interface ports: LocalTalk for the Macintosh and a Bi-Tronics parallel and a 9-pin RS-232C serial port for IBM PCs and compatibles. Although the printer is clearly designed for personal use, it does provide networking features — the 4MP can automatically switch ports and printing languages (PostScript Level 1 or 2 or PCL 5), depending on the incoming data.

The 4MP boasts a 32-bit, 20-megahertz RISC processor with a cache that makes fairly short work of PostScript printing. Like the 4ML, the 4MP incorporates HP's proprietary RET (Resolution Enhancement Technology) and MET (Memory Enhancement Technology). The former improves output quality by reducing jaggedness, and the latter optimizes memory usage during PCL 5 print jobs.

A 250-sheet paper tray accommodates most common sizes of paper (A4, letter, legal, and executive). Heavy stock (36- to 42-pound paper), transparencies, labels, and envelopes must be handled manually. The manual-feed slot is located on the front of the printer, and you use a dial on the back to switch to manual-feed mode. The 4MP's toner cartridges are rated at 3,000 pages each and use a microfine toner that enhances print quality.

Top-notch gray-scale output is what you expect from a 600-dpi laser printer, and the HP LaserJet 4MP delivers it.

To gauge the 4MP's print quality and speed, we used the same test files we used with the 4ML — a ten-page Word document (to test the printer's page-per-minute rating), two Adobe Photoshop gray-scale documents, and various type samples in sizes ranging from 7 to 72 points. Our test platform was a Mac IIcx with 8 megabytes of RAM, running System 7.1.

Our ppm tests clocked the printer at 3 ppm when printing at 600 dpi. Lowering the resolution to 300 dpi boosted the printer's speed to its advertised 4-ppm rating. Type samples printed at 600 dpi were razor sharp. Even at 300 dpi, type quality was impressive — we really had to strain our eyes to notice the differences between 300-dpi output and 600-dpi output. For gray-scale processing, the 4MP was a bit slower than the 4ML — the 4MP printed our full-page gray-scale document in about 3 minutes, compared to about 2.5 minutes for the 4ML — but this slightly slower speed is quite acceptable when you stop to consider that at 600 dpi, the 4MP is processing four times as much data as the 300-dpi 4ML. Gray-scale-output quality was top-notch.

The slight paper-curl problem we noted with the 4ML was present, and perhaps slightly worse, with the 4MP. We were able to use printed pages with a fax machine and a copier without a hitch, but the paper-curl issue is one you should consider before you buy, especially if you routinely use less expensive media or print on both sides of your paper. We recommend that you take your everyday paper stock to an HP dealer for a trial run.

The Bottom Line

The HP LaserJet 4MP is an excellent choice for the home and for small offices that don't require a high-speed, heavy-duty printer. It brings high-quality, 600-dpi PostScript printing within the reach of most users and establishes an unbeatable price/performance ratio for personal laser printers. / Gregory Wasson

HP LaserJet 4MP

RATING: ★★★★½

PROS: Top-notch output. Affordable price. Compact design.

CONS: Slight paper curling.

COMPANY: Hewlett-Packard, Santa Clara, CA; 800-752-0900 or 208-396-2551.

LIST PRICE: $1,729.

READER SERVICE: circle #401.

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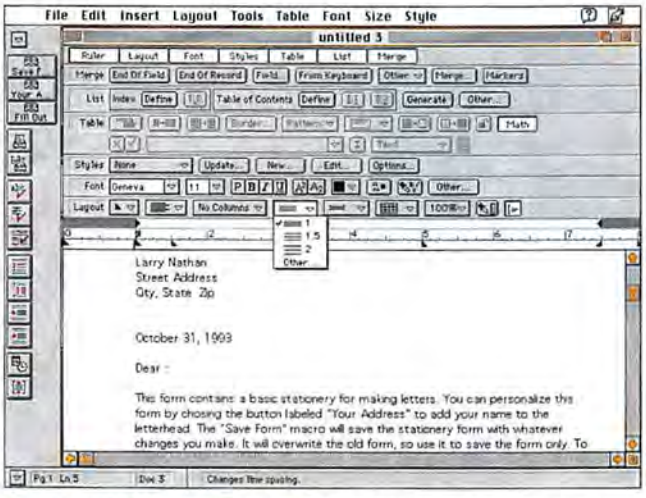
WordPerfect 3.0 / WordPerfect's latest upgrade raises the stakes in the high-end word-processing game.

WORDPERFECT IS POISED to challenge market leader Microsoft Word to a championship bout in the heavyweight-word-processor division. Although its beefed-up upgrade adds a diverse range of new and enhanced features, the most notable are those that take direct aim at Word.

New and Noteworthy

For starters, there are WordPerfect's new ruler bars, visible along the top of the document window, which provide convenient access to most of WordPerfect's formatting options, from specifying font attributes to setting up merge documents. These bars are similar to Word 5.1's more limited ruler and ribbon, and WordPerfect 3.0 offers seven of them, each of which you can hide or display.



You can get things done fast with WordPerfect's new ruler and button bars. Each ruler bar (top) can be shown or hidden. The customized button bar (left) can include buttons that trigger special macros.

Next, check out WordPerfect's wonderfully flexible button bar along the left side of the document window (of course, you can easily move it to the top, bottom, or right edge if you prefer.) The icon buttons on the default bar provide one-click access to many of WordPerfect's most frequently used commands (such as Find and Print) as well as a few not so common ones (such as that for creating bulleted lists). This button bar may sound much like Word's Toolbar, but WordPerfect goes a step further: In addition to the standard button bar, you get two more specialized button bars, one for working with graphics and the other for creating equations. You can customize any of the bars — or even create an entirely new one — by selecting from a library that includes buttons for almost everything WordPerfect can do. And, unlike in Word, the buttons in the library are predefined for particular commands, so you don't need to hunt for an appropriate icon for the command you want to add. You can also link a button or a button bar to a specific WordPerfect document.

WordPerfect's new table-generating commands mount a major assault on what has been, up until now, one of the most distinguishing features of Word. WordPerfect 3.0 not only matches what Word 5.1 can do with tables but it also exceeds it. For example, WordPerfect's Table ruler bar provides easy access to a formula bar that allows you to set up basic math calculations within a table — in effect turning your table into a minispreadsheet, with a minimum of effort.

Rounding out WordPerfect's list of notable new features are an excellent equation editor and a so-so grammar checker (both now completely integrated within the WordPerfect application), a much expanded set of import/export filters (including XTND support), superb hyphenation options, drag-and-drop editing, and two methods you can use to automatically back up your files.

Finally, users interested in keeping pace with Apple's latest technologies will be pleased to learn that WordPerfect 3.0 supports WorldScript, PowerTalk, and AppleScript (although AppleScript support is minimal and doesn't include recordability). Check out WordPerfect's Read Me files for information on these features, which aren't covered in the manual.

What's Not New

Many of WordPerfect's features remain largely unchanged in version 3.0, including some that could stand improvement.

When it comes to graphics and page layout, WordPerfect has always outperformed Word, whose capabilities are rather anemic and awkward. WordPerfect has better graphics-editing features and can more easily place text sidebars and graphics within a document as well as wrap text around such elements. But WordPerfect still requires you to go into a separate mode to work with graphics. A more integrated approach, such as that of ClarisWorks, would be much more convenient.

Similarly disappointing are the display limitations of endnotes, watermarks, headers, and footers. To see how these will look when printed, you have to use a separate Print Preview display, a view that has no editing options. Although Word shares many of these problems, it's too bad that WordPerfect passed up the chance to up the ease-of-use ante.

WordPerfect's paragraph-based style sheets, although quite capable, could benefit from a simpler interface. Making even minor modifications to a style can require you to go through several dialog boxes (although the new Styles ruler bar helps here). WordPerfect also lacks character-based styles, such as those of WriteNow and MacWrite Pro. Similarly, although WordPerfect has impressive sorting capabilities (including multilevel sorts and filtering of text that doesn't match certain criteria), they are among the most arcane of WordPerfect's features; we wouldn't mind sacrificing some of these capabilities for an easier-to-use sorting feature.

Macros remain one of WordPerfect's often overlooked strengths (Nisus is the only other word processor that has a macro capability). The four macros that ship with WordPerfect add useful functions. For example, one automates label creation for various sizes of Avery labels. Another automates the conversion of a text data file to a merge document (an otherwise tedious process, even with WordPerfect's new Merge ruler bar). You can, as always, create new

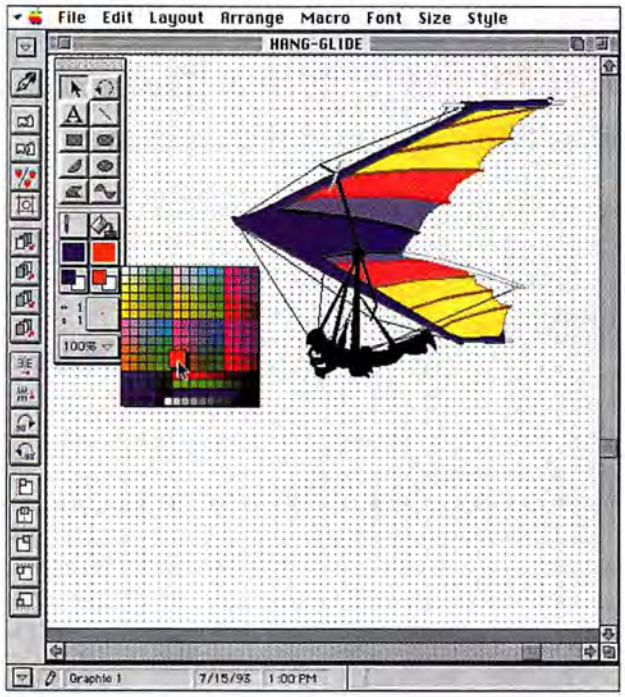
macros yourself, either by recording your actions or by typing a script. However, there is scant mention of macros in the printed documentation, with the full list of macro commands available only in a help file — even though WordPerfect used to come with a separate manual devoted entirely to macros. Perhaps the company is downplaying this feature to make the program seem less intimidating to learn, unfortunately for power users.

WordPerfect's spelling checker and thesaurus, although adequate, remain undistinguished, and there still isn't a glossary function. Also, WordPerfect's outlines remain little more than specially formatted paragraphs; you can't expand, collapse, or move headings. However, WordPerfect retains its more than adequate indexing and table-of-contents features, which are now made easier to use via the List ruler bar. The program also continues to excel in handling figure captions and cross-references — important features for creators of book-length documents.

WordPerfect's unusual approach to setting margins and other formatting characteristics may continue to be a sticking point for those users who are accustomed to Word's approach. Owing perhaps to its roots in a code-based DOS model (inserting codes to effect format changes in subsequent text), WordPerfect doesn't use separate dialog boxes for paragraph, section, and document settings. Instead, any format change typically continues through all remaining text until the end of the document (or until another change appears). Although you can modify WordPerfect's Preferences settings so that format changes are limited to the currently selected paragraph, we'd still like to see section- and document-based settings. Currently, it's hard to set up such rules as "start each section on a new page."

We discovered several, mostly minor, bugs in WordPerfect, the worst of which temporarily prevented us from opening or saving files. On another occasion, the program would not make a font change after we used the Select All command. We also had the Strikeout command mysteriously disappear from the Style menu.

Finally, WordPerfect continues to lack speed, especially for screen redrawing. After you've cut a passage of text, there is often a disconcerting time lag before the screen is correctly updated.



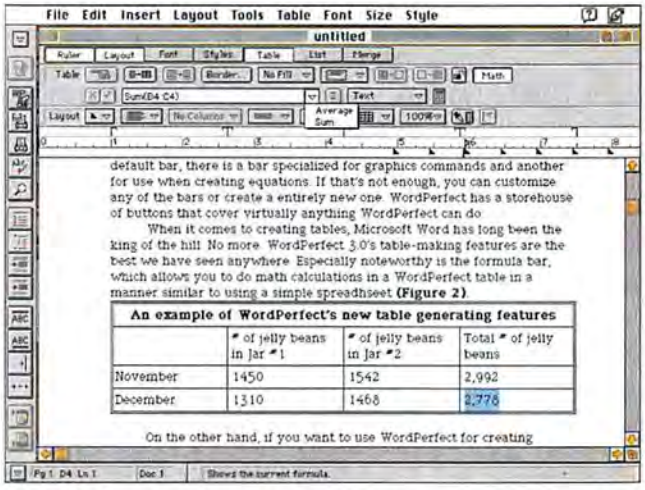
WordPerfect's drawing tools can compete with those in many stand-alone graphics applications. Still, graphics must be edited in a separate window, with the text hidden from view.

The Bottom Line

WordPerfect 3.0 boasts an attractive graphics-oriented interface that generally succeeds in combining simplicity of operation with one of the most power-packed feature sets available in any word processor for the Macintosh. With its editable button bars, user-selectable ruler bars, macro recording, and wide array of Preferences options, WordPerfect also gets top marks for the freedom it gives you to customize it. A few of its more advanced features, such as style sheets and sorting, could be more convenient to use, but this is not a major failing.

Still, even though WordPerfect 3.0 now equals or surpasses Word 5.1 in many critical areas — such as page layout, tables, macros, button-bar customization, and cross-references — we doubt that the differences are substantial enough to cause a significant number of Word users to jump ship.

For the moment, the most intense competition will be for users entering the market. We would advise such users not to be blinded by Word's market-share advantage. WordPerfect and Word are now so closely matched that a decision between them should depend on how each program's strengths and weaknesses meet your needs. WordPerfect 3.0 may not be perfect, but it may keep Microsoft from having the last Word. / Ted Landau



Turn tables into minispreadsheets with WordPerfect's formula bar, a subset of its new Table ruler bar.

WordPerfect 3.0

RATING: ♦♦♦♦

PROS: Strong page-layout and graphics features. Easy table generation. Multiple button bars. Macros.

CONS: Weak outliner. No glossary, separate section commands, or character-based styles. Separate graphics module.

COMPANY: WordPerfect Corp., Orem, UT; 800-451-5151 or 801-225-5000.

LIST PRICE: $495.

READER SERVICE: circle #402.

Data Translation Media 100 and Radius VideoVision Studio / Desktop video for the Mac goes prime time.

IN THE BURGEONING WORLD OF DTV (desktop video), 60 is the magic number. First-generation DTV products were capable of capturing only 30 of 60 fields per second, which resulted in compromised video quality. But two new releases — one from Data Translation and the other from Radius — break the capture-rate barrier, with support for 60 fields per second.

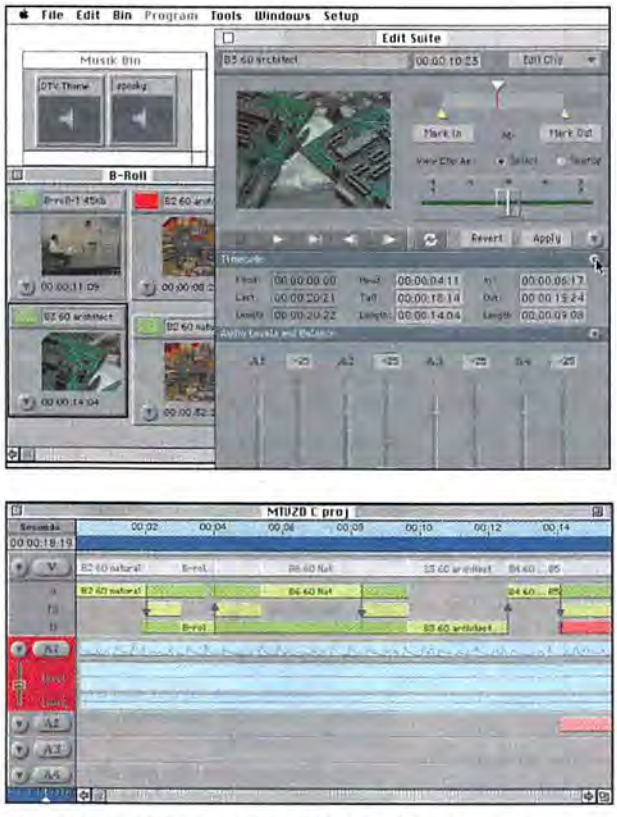
MacUser Labs

Data Translation's Media 100 is a proprietary hardware/software system. Positioned at the high end of DTV, the Media 100 costs $11,995 (two add-on packages, EDL Option and FX Option, are sold separately for $995 each). It boasts real-time-editing capabilities and top-quality video. Radius' $4,499 VideoVision Studio is a QuickTime-based system that costs significantly less than the Data Translation product yet delivers image quality that's surprisingly close to the Media 100's.

Data Translation Media 100

The Media 100 package consists of two NuBus cards, Data Translation's editing software, and all the cables you need to get up and running. The product's strength is the excellent quality of its video, which gives smooth motion and crisp, detailed images. In addition, the Media 100 supports CD-quality, 16-bit, 44-kilohertz sound (no additional audio card is required).

A key advantage of the Media 100 over the VideoVision Studio is the former's ability to operate in real time. Working in real time lets you view your movie full-screen on an NTSC monitor as you edit it. With a QuickTime-based system, such as the VideoVision Studio, you can view your entire movie full-screen only after you've compiled it into a QuickTime document; however, you lose access to the editing software during full-screen playback.



Data Translations' Media 100 DTV editing system features real-time-editing support and produces top-quality images. It comes with Data Translations' own editing software, shown here. The software is intuitive and provides most basic editing functions, but for special effects, you need the separate $995 FX Option package.

Hard-drive requirements are huge for DTV. The Media 100 provides nine compression settings that allow you to make trade-offs between image quality and file size. At each one of these settings, the system's compression facility is more efficient than those of QuickTime-based systems. You can store approximately 28 minutes of off-line-quality video or about 10 minutes of on-line-quality video on a single 1-gigabyte hard disk.

We were surprised to find that with all the compression flexibility it offers, the initial Media 100 release doesn't let you modify the hue, color saturation, brightness, or audio level of the video it's digitizing. At press time, Data Translation was promising to fill this gap with a free upgrade, which may be available by the time this review appears.

The Media 100's editing software features an intuitive interface and includes most essential editing functions. There are several items on our wish list, though. An audio-scrub feature and support for keyboard shortcuts, especially one for Play, are urgently needed. In addition, an autosave feature and more than one level of undo would enable users to experiment more freely.

The software provides all the basic audio functions you need, and volume and panning controls are well implemented. All four CD-quality audio-output tracks can play simultaneously without requiring you to premix the audio to two tracks.

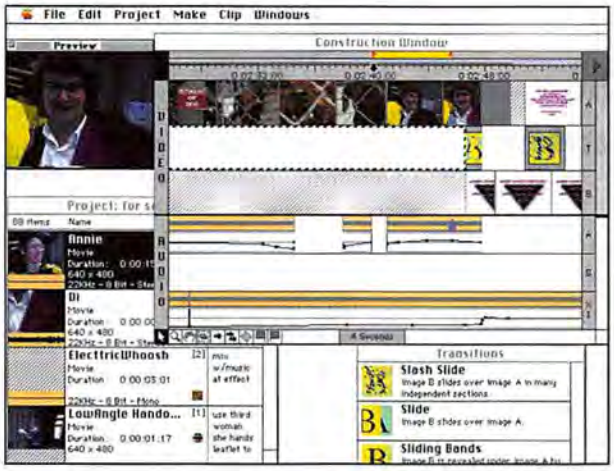
For special effects, Data Translation provides the separate FX Option package, which comes with 56 transitions and effects. Wisely, the company built its package on the Adobe Premiere architecture, so you'll be able to plug in additional effects and filters as Adobe develops them. The rendering speed and resolution of effects were impressive, but we ran into a few problems with the initial release of the software: Several effects were inoperable, and we encountered some bugs. According to Data Translation, these problems are going to be fixed in an upcoming version.

Radius VideoVision Studio

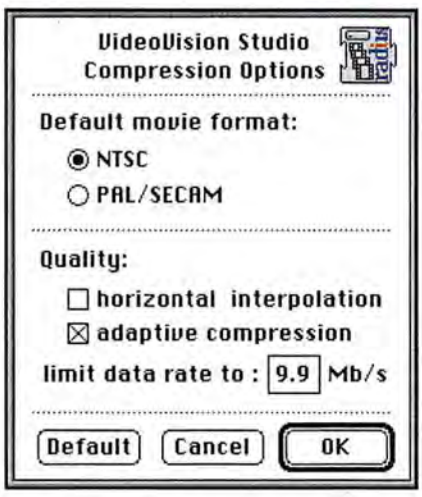
The VideoVision Studio is an attractively priced DTV system that has two significant advantages — it features an upgradable, modular daughtercard design and it's teamed with the elegant Adobe Premiere 3.0 video-editing software.

The VideoVision Studio daughtercard snaps into the Radius VideoVision card (a NuBus card that's also sold separately, without the daughtercard). Current owners of the VideoVision card can upgrade to the daughtercard system for $1,999. The VideoVision Studio's modular design leaves the door open for future add-on functionality.

The VideoVision Studio's image quality is



Radius' VideoVision Studio is an affordable QuickTime-based DTV system that works with Adobe Premiere video-editing software (top). The Compression Options dialog box (bottom) provides settings for compression and a variety of video formats.



the best we've seen among QuickTime-based products up to now (both RasterOps and SuperMac plan to have 60-field-per-second DTV systems by the time this review appears).

Multimedia authors especially will appreciate the VideoVision Studio's image-scaling ability. The system is an excellent choice for producing high-quality movies in QuickTime-sized windows for distribution on CD-ROM. During full-screen playback, however, we noticed some slight JPEG artifacts in a few color-rich and underlit areas as well as a hint of jaggies in high-contrast images.

A handy external breakout box provides two video/audio inputs, one video/audio output, and an extension connector for use with future Radius or third-party input sources.

VideoVision Studio supports 8-bit audio, although if you use the product with a Quadra 840AV, you can opt to use the Quadra's 16-bit audio support. One caveat: With QuickTime-based systems, 16-bit audio not only results in larger file sizes that make heavier demands on your storage devices than 8-bit audio but it also swells the data stream as your Mac processes both video and audio. That means you may have to capture and play back video at less than full-screen size to avoid degrading the video quality. The Media 100 system, on the other hand, had no problem processing both full-screen video and 16-bit audio.

Because of limitations that are inherent in current CPU power, the QuickTime format, and the VideoVision architecture itself, you'll find the VideoVision Studio's rendering speed is slow at times. You can partially overcome this limitation by capturing and previewing video in a small window and then rendering your final cut to a larger window. You can also choose to capture fewer than 60 fields per second. Another way to speed things up is to switch display modes — the VideoVision Studio's software lets you easily switch from 24- to 8-bit mode and back again.

At press time, we were given a brief peek at a VideoVision Studio software revision that promises to increase drive throughput by 20 to 30 percent — a significant speed enhancement that will be especially welcome to those working with a single drive. In addition, the upgrade will allow you to customize compression settings for your system configuration.

Also newsworthy is the announcement of an Apple DTV system for 1994 that will incorporate the Radius VideoVision Studio card.

The VideoVision Studio package includes VideoFusion 1.5 as well as Adobe Premiere 3.0. It requires a minimum of 8 megabytes of memory, but we recommend at least 20 megabytes. You also need at least one fast 1-gigabyte hard drive, although we highly recommend you use a disk array, especially if you require the highest-quality full-screen video. We also recommend a DAT drive for backup.

Our test platform for both the Media 100 and the VideoVision Studio was a Quadra 950 with 49 megabytes of RAM. For the Media 100, we used a single, fast 1-gigabyte drive. For the VideoVision Studio, we used two 2-gigabyte internal drives configured as a disk array. Additional equipment consisted of an RGB monitor, an NTSC TV monitor, and a VCR.

The Bottom Line

As DTV hits its stride with 60-field-per-second systems, video professionals and multimedia authors have more quality choices than ever before. Potential buyers need to weigh budget, work style, and image-quality requirements carefully when choosing the right system for their needs.

For those looking for one of the most affordable high-quality DTV systems, the Radius VideoVision Studio — with its elegant Adobe Premiere video-editing software — is an excellent buy. The Media 100 is also a worthy offering. It may be pricey, but the Media 100's superior image quality and real-time-editing support make it a compelling choice. / Lisa Rudman

Data Translation Media 100

RATING: ★★★½

PROS: Excellent-quality video. Real-time editing.

CONS: Pricey.

COMPANY: Data Translation, Marlboro, MA; 508-460-1600.

LIST PRICE: $11,995; EDL Option, $995; FX Option, $995.

READER SERVICE: circle #403.

Radius VideoVision Studio

RATING: ★★★½

PROS: Aggressively priced. Teamed with Adobe Premiere editing software.

CONS: Slow rendering.

COMPANY: Radius, Inc., San Jose, CA; 800-227-2795 or 408-434-1010.

LIST PRICE: $4,499.

READER SERVICE: circle #404.

40-Megahertz 68040 Accelerators / Compatibility, not speed, tops the shopping list for a 68040 accelerator.

IF THE IDEA OF SUPERCHARGING your Mac by using the same type of processor as is built in to Apple's top-of-the-line Quadra 840AV is appealing, you may want to consider buying a third-party 40-megahertz 68040 accelerator. We took a look at four cards — the Applied Engineering TransWarp 6440, DayStar Digital Turbo 040, Fusion Data TokaMac 40c, and Mobius Speedster AC440f — that currently offer the greatest speed boost to a variety of Macintosh computers. To help you decide which to buy, we put each card through its paces in an extensive suite of application-based testing at ZD Labs. We also performed exhaustive day-to-day compatibility testing. Surprisingly, our test results showed that speed may not be the most important criterion when choosing a 68040 accelerator.

MacUser Labs

How Fast Is Fast?

With little difference in price among the 40-megahertz 68040 accelerators we tested, speed, software compatibility, and tech support remain as key factors in choosing one card over another. However, our application-based testing — which included a Microsoft Excel recalculation, an Adobe Illustrator preview, and an Adobe Photoshop Gaussian blur — proved that speed is also not a major differentiating factor. We found only a minuscule difference between the two cards — the Fusion Data TokaMac 40c and the DayStar Turbo 040 — that provided the greatest boost in speed.

Although the 68040 accelerators we tested are PDS cards that work in several Mac models, we conducted our tests — with and without each card's secondary cache (if available) — with a Mac IIci. The 68040 processor comes with a primary cache built in, but each card provides a secondary cache as well. The TokaMac 40c is the only card in the group that has a built-in 128K secondary cache; the others have secondary caches as options (Mobius released its cache after our testing). We found that, on average, a card with a secondary cache increases the Mac's speed by 30 to 40 percent over a card without one. Considering that a card with a secondary cache costs only 13 percent more than one without, a secondary cache more than pulls its weight and is a worthwhile option.

The Fusion Data TokaMac 40c and the DayStar Turbo 040 ran largely neck and neck in each test, although overall, the Mac with the TokaMac 40c had a slight lead, being more than 300 percent faster than our unaccelerated Mac IIci and 79 percent as fast as a Quadra 840AV. Close on their heels came the Mac with the AE TransWarp 6440. The Mobius Speedster AC440f, which lacked a secondary cache at testing time, provided the least acceleration. One caveat: The advantage of an accelerator varies greatly, depending on the task at hand. Computation-intensive tasks, such as recalculating an Excel spreadsheet, show the most improvement. But don't expect dramatic results when your Mac is performing operations that require the processor to wait for slower system components, such as a hard drive.

Given the close results of our speed tests, we placed compatibility at the top of our shopping list. Although we experienced no compatibility problems when we did our speed testing, we did use the latest version of every application as well as System 7.1 without third-party extensions. In our day-to-day compatibility tests on a Mac IIci running System 7.1 and a variety of third-party extensions, all the cards exhibited some problems because of differences in the way the 68040 and the 68030 caching schemes operate. Anyone who has upgraded to a Quadra has experienced similar problems, which aren't trivial. Identifying problematic software may take weeks, and upgrading to the latest 68040-compatible version of every application can be expensive.

To help you cope with compatibility problems, each card comes with a control panel that lets you either revert to the 68030 primary cache or turn the primary cache off altogether. Both options degrade speed significantly, however. The control panel also lets you create application-specific settings for programs you know cause problems with a card, so when you launch the program, the card automatically switches to 68030 mode and remains there until you've quit the application.

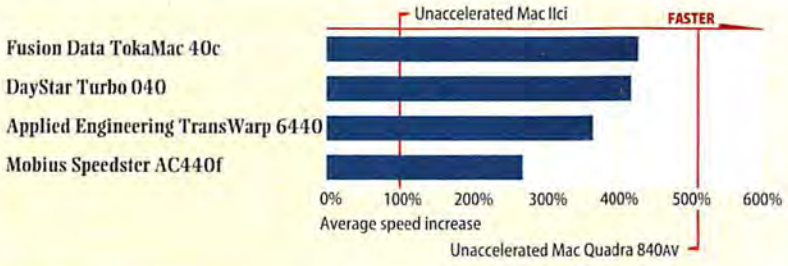
The Mobius Speedster AC440f and the AE TransWarp 6440 control panels each add icons to the menu bar that indicate the current cache setting. The DayStar Turbo 040 doesn't have this useful feature, but the setting is visible in its control panel. With the exception of an alert box that appears briefly as the software shifts modes, the Fusion Data TokaMac 40c lacks a visual indicator for the current cache mode.

In our real-world tests, the Turbo 040 proved the most stable, perhaps because it starts the Mac with the card's 68040 already engaged. The other cards don't turn on the accelerator until their control panels have loaded. The TokaMac 40c exhibited a few problems, apparently of its own making. The control panel is supposed to replace the Apple-menu icon with its own icon to indicate the presence of the card, but the icon never appeared. Furthermore, we were successful in retrieving mail from America Online only after we had turned off the accelerator, even though the America Online

figure 1

Photo Finish

A 40-megahertz 68040 accelerator can significantly improve the speed of a Mac IIci for computation-intensive tasks. Our tests found that there is very little difference between the two top-rated cards in terms of the speed boost they provide.



version we were working with, 2.0.1, is compatible with the 68040 processor.

Retrieving America Online mail proved even more troublesome for the Mobius Speedster AC440f: It froze completely. Furthermore, the sound effects in many programs were accompanied by a shrill noise and we encountered frequent error-type-11 crashes in both Word 5.0a and the Finder when switching cache modes.

The AE TransWarp 6440 was plagued with a slew of problems when running 68040-compatible programs, including America Online 2.0.1, FileMaker Pro 2.0v1, Managing Your Money 5.0, and StickyBusiness 1.6.1. These problems were reproducible time and again, even with all extensions turned off.

Tech Support

Because it's clear that 68040 accelerators are far from being install-and-forget products, tech-support quality is almost as important as compatibility. DayStar offers a 30-day money-back guarantee, a three-year warranty, and a trade-up for the difference in retail price. Tech support is available toll-free on weekdays from 9:00 A.M. to 6:00 P.M. EST. Our calls were promptly returned, and our questions answered correctly.

Applied Engineering also offers a 30-day money-back guarantee, a three-year warranty, and a trade-up for the difference in retail price. Tech support is a toll call and is available weekdays 9:00 A.M. to 5:00 P.M. CST. We got through every time we called, but although several of our problems were acknowledged, no fixes were promised.

Mobius offers a 30-day money-back guarantee, a three-year warranty, and a trade-up for the difference in retail price *plus* an additional $50 to $100. Tech support is available toll-free on weekdays from 8:00 A.M. to 5:00 P.M. PST. All of our calls were returned within 24 hours. The tech-support representative was courteous and knowledgeable, but at press time, our sound and America Online problems remained unresolved.

Fusion Data offers a 30-day money-back guarantee, a one-year warranty, and a trade-up for the difference in retail price. Tech support is a toll call and is available on weekdays from 8:30 A.M. to 5:00 P.M. CST. All of our calls were returned within 24 hours.

Installation of each PDS card we tested was easy, without the assistance of an authorized Apple dealer. The DayStar Turbo 040's documentation is a standout, with color photos and a separate section for each Mac model that accommodates the card. By contrast, AE's text-only directions don't distinguish among the different Mac models. Both the Mobius and the Fusion Data manuals could use improvement — Mobius' documentation ignores the Memory control panel, for example, and illustrations in Fusion Data's documentation are rather crude.

The Bottom Line

If you're looking for a cost-effective way to speed up your Mac, installing a 40-megahertz 68040 accelerator is the best way to go. Although the cards come with their fair share of software-compatibility problems, the truth is you'll probably run into some of the same difficulties if you purchase a Quadra 840AV, which uses the same processor as the accelerators do.

Weighing compatibility, tech support, and speed, we give the nod to the DayStar Turbo 040. Although it didn't produce the greatest speed boost, it came in a very close second. More important, it was the most stable accelerator we tested and DayStar backs the DayStar Turbo 040 with first-class documentation, tech support, and trade-up policies. / Owen W. Linzmayer

Julie Baher and Raymond Zhou of ZD Labs managed the testing for this review.

Applied Engineering TransWarp 6440

RATING: ★★

PROS: Visual cache-setting indicator.

CONS: Severe compatibility problems.

COMPANY: Applied Engineering, Dallas, TX; 800-554-6227 or 214-241-6060.

LIST PRICE: $1,249; cache, $189.

READER SERVICE: circle #405.

DayStar Turbo 040

RATING: ★★★½

PROS: Big speed boost. Excellent support and documentation.

CONS: Compatibility problems.

COMPANY: DayStar Digital, Flowery Branch, GA; 800-962-2077 or 404-967-2077.

LIST PRICE: $1,499; cache, $199.

READER SERVICE: circle #406.

Fusion Data TokaMac 40c

RATING: ★★★

PROS: Big speed boost.

CONS: Compatibility problems. Lacks cache-setting indicator.

COMPANY: Fusion Data Systems, Austin, TX; 800-285-8313 or 512-338-5326.

LIST PRICE: $1,399; cache, $200.

READER SERVICE: circle #407.

Mobius Speedster AC440f

RATING: ★★½

PROS: Visual cache-setting indicator.

CONS: Smallest speed boost. Compatibility problems.

COMPANY: Mobius Technologies, Emeryville, CA; 800-800-4334 or 510-654-0556.

LIST PRICE: $1,399; cache, $199.

READER SERVICE: circle #408.

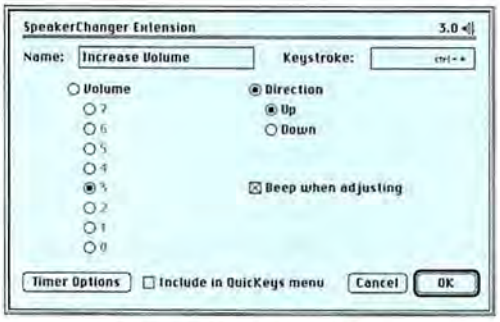
QuicKeys 3.0 / Task-automation utility just keeps getting easier.

FEW PROGRAMS HAVE done as much to make Macintosh users' lives easier as CE Software's QuicKeys, now faster and easier to learn in version 3.0. QuicKeys automates repetitive tasks on your Mac, letting you execute almost any task or sequence of tasks with a single keyboard shortcut. If you perform an operation more than once a day, it's a good candidate for a QuicKeys shortcut.

Take a Shortcut

QuicKeys is based on the concept of *shortcuts*. A shortcut consists of a task or series of tasks and a trigger that executes the task sequence. Usually triggered by a keystroke, QuicKeys shortcuts can also be triggered from a menu, a pop-up palette, a quick-reference window, or a timer. A shortcut can also be saved as a QK Icon, a self-contained program you trigger by double-clicking. If you have one of the new AV Macs, you can use Apple's PlainTalk speech recognition to trigger a shortcut with your voice.

You can create a shortcut either by definition or by example. To create a shortcut by definition, you choose a shortcut category from the Define menu and then use a dialog box to specify shortcut options and assign a trigger. Creating a shortcut by example is even easier — just turn on QuicKeys' built-in sequence recorder and perform a task or series of tasks. The recorder doesn't always interpret your actions exactly as you intend it to — for example, it might interpret your pause as a timed wait or a conditional wait. However, you can fine-tune your shortcut with the easy-to-use sequence editor after you've recorded it.



QuicKeys 3.0's seamless integration with System 7 makes it easy to create shortcuts that perform system-level tasks. Once you've defined the shortcut shown here, you can increase your Mac's speaker volume at any time just by pressing Control-+.

Although all the shortcuts QuicKeys offers are useful, we found some more noteworthy than others. Among our favorites are:

Button shortcuts, which let you click on buttons and check boxes without touching the mouse.

Date/Time shortcuts, which let you type today's date and time with a single keystroke.

File Launch shortcuts, which let you open a folder, a document, or an application with a single keystroke.

Menu Selection shortcuts, which let you choose any item on any menu without touching the mouse.

Mousies shortcuts, which let you perform window manipulations — zoom, scroll, page up, and so on — from the keyboard.

Text shortcuts, which let you type words, phrases, and even entire paragraphs with a single keystroke.

SpeakerChanger shortcuts, which let you change the volume level of your Mac without opening the Sound control panel.

Of course, the most powerful type of shortcut is a *sequence*, which strings together a series of individual shortcuts and performs them in sequence. You can, for example, create a sequence that launches your word processor (File Launch shortcut), selects New from the File menu (Menu Selection shortcut), types five carriage returns (Text shortcut), types today's day and date (Date/Time shortcut), types two more carriage returns followed by *D-e-a-r* (Text shortcut), and then saves the file (Menu Selection shortcut) to your Correspondence folder (Folders Extension shortcut).

Another powerful feature is QuicKeys' seamless integration with System 7 (required for this version). You can easily set up shortcuts involving Chooser and control-panel actions — for example, a shortcut that selects a printer without your having to open the Chooser.

The Best Gets Better

Some users found earlier versions of QuicKeys difficult to learn. Version 3.0 addresses that complaint with improved documentation; recording and playback palettes for better control of sequences; and a Utilities menu that provides easier access to QuicKeys' utilities, such as a template-printing application.

Another complaint about earlier versions was that QuicKeys slowed down your Mac, especially less powerful models (the program runs on a Mac Plus or later with a hard drive). Version 3.0 is noticeably better, using less memory and less background-processing time than previous versions.

For power users, version 3.0 adds support for conditional branching in scripts (based on the state of a window, button, cursor, menu, application, or the Clipboard or the system clock). Although QuicKeys still lacks some of the sophisticated controls that its competitor Tempo II Plus has (such as the ability to evaluate variables), this version's combination of power and ease of use will work well for most users.

The Bottom Line

System software and AppleScript may someday provide the power and convenience of QuicKeys, but why wait? QuicKeys 3.0 has it now. And it won't become obsolete as AppleScript becomes more powerful and widely supported, because QuicKeys supports AppleScript, UserLand Frontier, and any other scripting language that is compliant with OSA (Open Scripting Architecture). So QuicKeys 3.0 works with any application — Apple-event/AppleScript-savvy or not.

QuicKeys may be the most useful third-party utility ever made. If you've never used it, you owe it to yourself to check out its time-saving wonders; if you're already a QuicKeys user, you'll find version 3.0 is well worth the upgrade cost. / Bob LeVitus

QuicKeys 3.0

RATING: ★★★★½

PROS: Easy shortcut creation. Well integrated with System 7. Predefined shortcuts for some tasks.

CONS: Recorded sequences may need fine-tuning.

COMPANY: CE Software, West Des Moines, IA; 515-221-1801.

LIST PRICE: $169; upgrade, $49.95.

READER SERVICE: circle #409.

HP Portable DeskWriter 310 / Desktop-printer power in a portable design.

AT $379 AND ABOUT FOUR POUNDS, the HP Portable DeskWriter 310 is quite a bargain for PowerBook users: a truly mobile printer that delivers quality output on plain paper and other media. A 300-dpi, QuickDraw-based, thermal-inkjet printer with a color-cartridge option, the 310 can also serve as a decent desktop printer, if you buy the optional cut-sheet feeder.

MacUser Labs

Stash or Carry

Much thought clearly went into making the 310 both portable and full-featured — as well as flexible enough for easy switching between a desktop and a travel setup.

The Portable DeskWriter 310 can operate either from its amazingly light AC adapter (10.5 ounces) or from an optional, rechargeable NiCad battery ($49). The battery lasts for about 100 prints and can be recharged in the printer when the AC adapter is used. A handy included utility tells you the battery's power level.

The highly compact printer (12 inches long, 5.75 inches wide, and 2.5 inches high) stands upright when you add two plastic feet. You can feed paper by hand or purchase the optional cut-sheet feeder (available separately for $99 or in a $455 bundle with the printer), which holds as many as 60 sheets of paper and integrates smoothly with the printer, for a combined weight of less than 8 pounds.

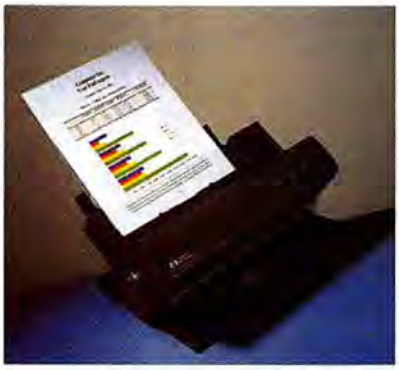
Like the feeder, color capabilities are an option. The $49 Color Kit offers 16.7 million colors by means of a three-chamber ink cartridge (containing cyan, magenta, and yellow ink) that easily replaces the black-ink cartridge. The kit also includes a cartridge-storage container, color-use instructions, and the media samples.

Additional capabilities you control through the Portable DeskWriter 310's driver are much like those on the desktop-only HP DeskWriter C. You can scale your document from 25 to 400 percent in 1-percent increments and choose from four paper sizes (letter, legal, A4, and Executive) and four types of media (plain paper, transparencies, HP's special inkjet paper, and HP's glossy paper). You can also choose between two dither methods — the geometric Pattern method (best for solid-color graphics) or the slower, more random Scatter method (best for complex images).

Connectivity is another option. The AppleTalk-ready 310 can operate on a network or connect directly to a Mac via the included serial cable.

Setting up the 310 is a breeze. An installer places all the necessary software (fonts, drivers, and so on) into the appropriate locations on your hard disk (HP recommends at least 5 megabytes of free disk space and 4 megabytes of system memory).

Once you've connected the printer and installed the software, you use the Chooser to select the printer. You can then select whether you want to have background printing on or off.



The compact, 4.3-pound Portable DeskWriter 310 is well designed for life on the road *and* reliable office performance — just add two plastic feet and the optional cut-sheet feeder.

Respectable Results

Our tests with the color cartridge found the output quality to be good, except when the document contained large areas of solid color; in such cases, the paper ended up curled and looked somewhat waterlogged. This problem is no worse than with other inkjet printers, though. In another tricky area — the mixing of colors to achieve a composite black — the Portable DeskWriter 310 does a better job than the DeskWriter C.

In general, the Portable DeskWriter 310 does a good job with every type of output media except transparencies. Plain paper gives decent results, but HP's special paper bleeds less and produces more-vibrant colors. HP's glossy paper makes colors come alive, but it costs slightly more than $1 per page. As with the DeskWriter C and the DeskWriter 550C, you'll find output on transparencies less than optimal: The image looks good until you show it on an overhead projector, where it appears washed-out.

Speed is another area in which the Portable DeskWriter 310 performs comparably to the DeskWriter C — each printer took about 45 seconds to print our test page of black text in Draft mode (and a little under 1.5 minutes for the same page in Best mode) with a black-ink cartridge installed. Printing times for the same page when we installed the color cartridge were longer but also similar for the two printers. The DeskWriters are QuickDraw-based, so printing speed depends partly on your Mac's power.

The one noteworthy problem we found was the lack of a gauge to check the ink level in your cartridge. You find out too late that you're out of ink when your output reflects the obvious — a big annoyance if you're traveling without an extra cartridge.

The Bottom Line

With the Portable DeskWriter 310, HP has succeeded well in its effort to give on-the-go PowerBook users a dependable, compact output device — its design is the most elegantly portable we've seen so far. At the same time, the company has created a desktop inkjet printer with quality and performance comparable to that of the DeskWriter C. Achieving both these results in one device makes the Portable DeskWriter 310 a notable bargain. / Tony A. Bojorquez

HP Portable DeskWriter 310

RATING: ♦♦♦♦

PROS: Extremely light and portable. Desktop-quality output. Color option.

CONS: No ink-level gauge. Transparencies look washed-out.

COMPANY: Hewlett-Packard Co., Santa Clara, CA; 800-752-9099 (U.S.), 800-387-3867 (Canada), or 208-323-2551.

LIST PRICE: $379; with cut-sheet feeder, $455; NiCad battery and Color Kit, $49 each.

READER SERVICE: circle #410.

Fontographer 4.0 / Altsys speeds the pace of type design.

IF CREATIVE GENIUS is truly 1-percent inspiration and 99-percent perspiration, then type designers spend an awful lot of time sweating it. To make things easier, Altsys has released version 4.0 of Fontographer, a powerful design tool that helps users channel creative ideas into type.

Fonts by Design

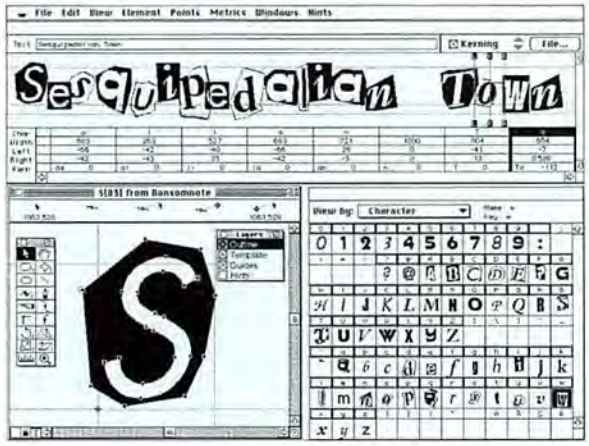
Fontographer is tailored for serious name-one-after-me type designers, but it's also a good tool for those who simply want to add fractions, swash characters, or a new style to their favorite font. The program lets you create fonts in several ways. You can draw them from scratch or begin with an auto-traced scanned image. You can also blend two existing fonts as well as manually or automatically modify existing fonts.

The latest release of Fontographer focuses on productivity enhancement. Altsys has stuffed the tool palette chock-full of convenient new tools. In addition, features such as automatic kerning, spacing, and path cleaning free designers from much of the busywork of font design. Coupled with redesigned menus and dialog boxes, these improvements make Fontographer more accessible to novices while letting the program retain the power that experts need. Be forewarned, however, that Fontographer's new talents come at a price — performance can be sluggish, and the program's suggested RAM allotment has nearly doubled, to 2.25 megabytes.

You draw your font's characters in Fontographer's Outline window, which now boasts a floating tool palette that contains nearly twice as many tools as before. Many new tools — including the flip, skew, scale, rotate, knife, and magnify tools — resemble those in draw programs such as Aldus FreeHand and Adobe Illustrator. These familiar tools not only make it easy to learn to use Fontographer but they also make it easy to get the results you want. For example, you can now manipulate characters with a rotation tool, rather than typing rotation degrees into a dialog box and using the trial-and-error method to settle on the correct angle (which you can still do too). Other Outline-window enhancements include flicker-free dragging and the ability to edit in Preview mode.

Time to Clean Up

The biggest new time-saver in Fontographer's Outline window may be the Clean Up Paths feature, which addresses the problem of character outlines that are either cluttered with too many points or that lack points where they're needed. This problem is a threefold annoyance — editing fonts is tedious, the fonts sometimes don't look crisp, and point-heavy fonts take forever to print. When you select Clean Up Paths, Fontographer removes unnecessary points and adds new ones that optimize the quality of your outlines.



Fontographer 4.0 boasts a restocked floating tool palette (lower left) and a revamped Metrics window (top).

We had great success with this feature but had to experiment with the various sensitivity levels to get the results we wanted. And you'll need patience — processing a complete character set for several typefaces took three to eight minutes per set (depending on the typeface) on a Mac IIcx.

One of the hairiest font-design challenges is defining kerning pairs or setting aesthetically pleasing spacing between letters. For example, you may want to tuck a small *o* pleasingly close to a *T*. Fontographer still offers manual kerning and spacing controls (called metrics), but the new version adds the Metrics menu, which makes these commands more accessible. In addition, the new Set Metrics dialog box lets you control metric settings more precisely than before and the revamped Metrics window provides excellent visual feedback as you tweak metrics values.

If thinking about metrics makes your eyes glaze over, you can turn to Fontographer's powerful new automatic-kerning and -spacing controls. The dialog box for each option offers two modes: Easy and Advanced. In each mode, invoking Auto Spacing or Auto Kerning causes Fontographer to examine your fonts and either automatically set spacing for each character or define as many kerning pairs as you request. This process, too, works slowly, but it's still quicker than doing it manually and, in practice, the results are good. Fontographer's kerning pairs are well defined. However, serious designers will use these automatic conveniences only as starting points — computer algorithms can't substitute for a trained designer's eye.

Fontographer can generate TrueType and PostScript Type 3 fonts for the Mac and machines running Windows; PostScript Type 1 fonts for the Mac and machines running Windows, NeXTstep, or Solaris; and Adobe multiple-master fonts for the Mac.

The Bottom Line

The latest version of Fontographer is a type designer's dream come true. Although its sluggishness may at first disappoint veteran users who have grown accustomed to the snappier response of the previous release, Fontographer 4.0's new conveniences more than make up for the hit in speed. In all, Altsys took a stellar performer and improved it considerably. / Shelley Cryan

Fontographer 4.0.2

RATING: ★★★★½

PROS: Comprehensive, advanced tool set. Automated controls.

CONS: Sluggish response.

COMPANY: Altsys Corp., Richardson, TX; 214-680-2060.

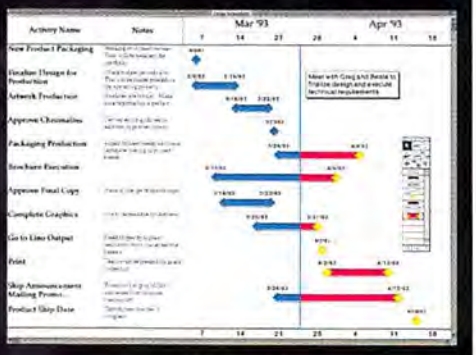
LIST PRICE: $495.

READER SERVICE: circle #411.

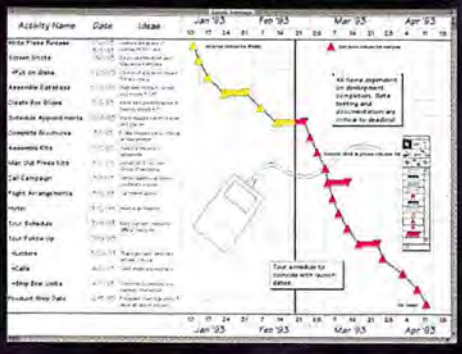
(America Online)

(America Online is not really a pair of glasses, it is an online information service.)

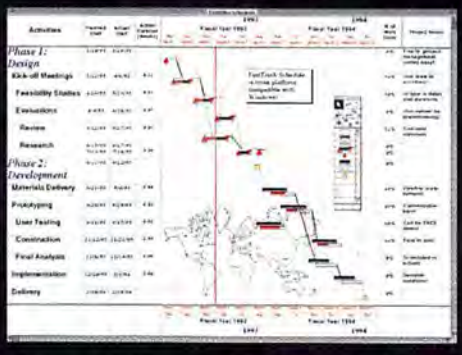
It's about Time!



And Projects!



And Schedules!



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CIRCLE **16** ON READER SERVICE CARD

Tribe TribeStar / This packet-switching LocalTalk-to-Ethernet hub can greatly improve network performance.

WHEN LOCALTALK IS too slow but you can't afford to go all-Ethernet, consider a compromise: Tribe Computer Works' TribeStar hub, which attempts to close the gap between slow LocalTalk clusters and an Ethernet backbone.

MacUser Labs

A Hub with a Difference

The TribeStar is a LocalTalk hub that has eight ports. Its unique features are an additional Ethernet port, which lets you bridge a LocalTalk workgroup to Ethernet without a router, and built-in packet-switching technology. Packet switching means network packets are examined and delivered to the destination port only, rather than broadcast around the whole star. This traffic isolation can speed things up considerably.

Tribe says its product can support as many as 32 LocalTalk users (4 on each port) in addition to connecting to an Ethernet network. Other LocalTalk hubs can have 12, 16, or even 24 ports and thus theoretically can support a higher maximum number of users. The TribeStar's advantage is that each port is isolated from the rest of the network, giving users who share a port a larger portion of the available bandwidth to work with. Using the Ethernet port to separate a busy file server from the rest of the network and carefully placing LocalTalk users to minimize traffic on each port can further exploit the TribeStar's strengths. At $1,795, the TribeStar's per-port cost is higher than that of a 12-port Farallon StarController ($1,595), but the TribeStar setup provided significantly faster file copies in our tests.

Timing Some Copies

MacUser Labs hooked up 15 Macs (LCs, IIci's, and Quadra 700s) to a TribeStar's LocalTalk ports and an Apple Workgroup Server 80 to the Ethernet port (by way of an NRC MultiGate Ethernet hub). To create background traffic, we copied a 100K file from the server to one of 14 LocalTalk Macs every 30 seconds. At the same time, we timed how long it took to copy a 5-megabyte file from the 15th LocalTalk Mac (a IIci) to the server. The copy took 4.5 minutes over the TribeStar — compared to 12.5 minutes for the same copy (with the same background traffic) over a LocalTalk network with a StarController hub. The TribeStar's traffic isolation makes all the difference, because the same copy with no background traffic took about 4.5 minutes over both the TribeStar and the all-LocalTalk network. Of course, the same copy over Ethernet took substantially less time, both with traffic (37 seconds) and without (48 seconds).

We found the TribeStar easy to install and operate. The included software gathers statistics on each port and can graph the network's activity.

The Bottom Line

The TribeStar will appeal to two types of users: those who are committed to continued use of LocalTalk and those for whom the transition to an all-Ethernet network is delayed by cost or logistical issues. If you have a LocalTalk star hub and a file server, a TribeStar can provide significant performance gains with minimal rewiring. Of course, using the TribeStar can't get you the speed of raw Ethernet — if you haven't yet installed a LocalTalk star hub in your phone closet, you may want to skip the hassle of rewiring for a TribeStar and wait until you can afford complete Ethernet rewiring. But if you'd rather avoid the cost and complexity of Ethernet, getting a TribeStar is a handy way to break through LocalTalk-traffic slowdowns. / Shelly Brisbin

P. J. Go managed the testing for this review.

Tribe TribeStar

RATING: ★★★½

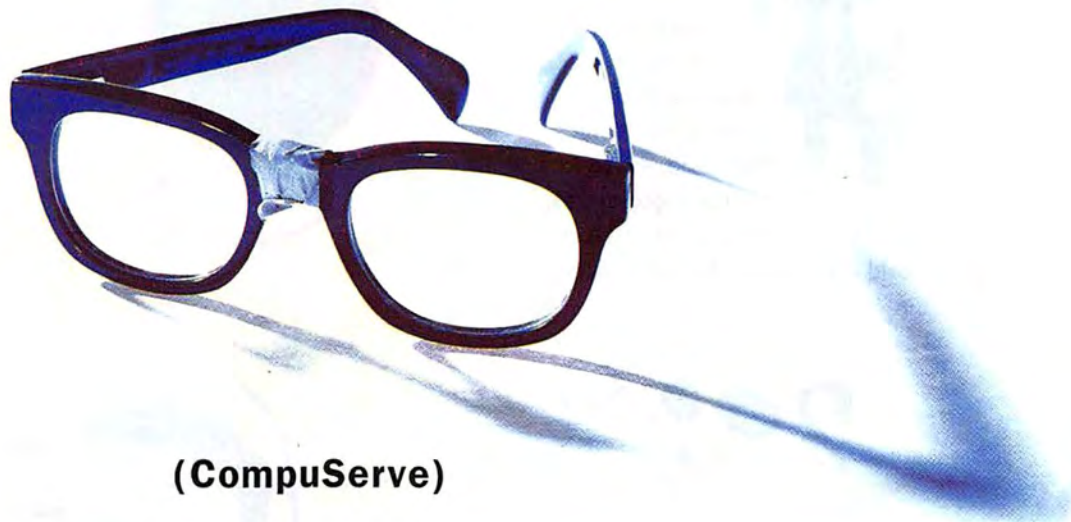
PROS: Unique, cost-effective bridge between LocalTalk and Ethernet. Packet switching distributes network load efficiently.

CONS: High cost per port.

COMPANY: Tribe Computer Works, Alameda, CA; 800-778-7423 or 510-814-3900.

LIST PRICE: $1,795.

READER SERVICE: circle #412.



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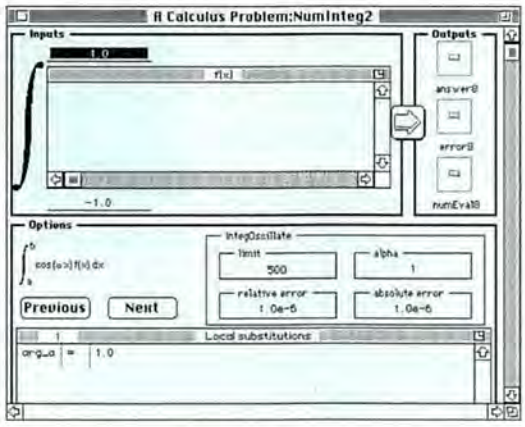
CIRCLE **76** ON READER SERVICE CARD

HiQ 2.0 / The smart way to solve differential equations on your desktop.

THE NEXT TIME SOMEONE tells you Macs can't do real math, reach for a copy of HiQ. HiQ not only solves applied-math and engineering problems easily but it also does so with a friendly interface and a speed that beats all competitors' — plus version 2.0 has many handy new features.

With version 2.0, HiQ's developers have revamped the program's interface to improve adherence to Mac conventions (adding a Find command, for example). They've also added a graphical function browser, making it easier to build custom mathematical worksheets, models, and equations.

New features include built-in *solvers* (HiQ parlance for symbols) that let you approximate or calculate integrals and derivatives and handle ordinary differential equations (ODEs). There's also a new function that performs partial-derivative meshes, important in many engineering and modeling contexts. In addition, the new version lets you overlay plot graphs and animate graphs to show changes over time.



HiQ's built-in solvers make it easy to calculate integrals and derivatives, and the program handles differential equations with impressive speed.

Using HiQ

To use HiQ, you begin by defining the vectors, graphs, matrices, scalars, and solvers that make up your problem (called a worksheet). Then you open one of the solvers to start the computation. HiQ gives you ten classes of prebuilt solvers (no programming required) for standard applied-math problems: an expression evaluator, a nonlinear system solver, an integrator, an ODE initial-value problem solver, an ODE boundary-value problem solver, an integral-equation solver, an optimizer, a root solver, a Fourier analyzer, and a statistical analyzer.

If your numerical problem can't be handled by a prebuilt solver, you can string together some of HiQ's 600 built-in functions or write a script fairly easily. HiQ's functions provide just about every kind of statistical, matrix-algebra, complex-math, integral, or differential capability you can think of, from trigonometric and transcendental functions to business and statistical functions to Fourier-analysis functions.

HiQ's object-oriented scripting language isn't difficult. If you can learn Pascal, HyperTalk, or AppleScript, you can easily learn to program a HiQ solver script from the thin but effective scripting documentation. You also get a good script editor, commands for automated graphing, and the ability to annotate worksheets so you can use them as illustrative or predictive models.

HiQ Highs and Lows

Why buy HiQ instead of MATLAB, Maple, Mathematica, or any other computational program? Primarily because of the strength and power of its analysis engine. We've found it to produce noticeably faster and more-accurate results than its competition when installed on an equivalent Mac — especially for problems involving partial differential equations (PDEs).

HiQ's other main advantage is its project-worksheet orientation. Unlike Mathematica's workbooks (which are both very powerful and very difficult to use), HiQ's desktoplike, graphical worksheets make it easy for you to organize and integrate all phases of a mathematically defined project. You can organize data-representation symbols, graphs, HiQ scripts, annotations, and solutions in a way that feels completely natural. HiQ also provides excellent graphing capabilities, although not on par with those of the UNIX version of Mathematica.

What HiQ can't do is symbolic algebra — demonstrating proofs, for instance, or solving equations involving imaginary numbers. For problems such as these, you need something like Mathematica or the old mainframe workhorse MacSyma.

Also, although HiQ's scripting language is easy to learn and optimized for doing math, it doesn't let you use code examples from other mathematical libraries, such as those in the THINK Object Library or IMSA mathematics library. You also can't use AppleScript or Apple events yet. However, these are limitations only if you're intending to incorporate HiQ into part of a bigger software-development project.

One more potential drawback is that HiQ needs a powerful Mac — one with at least a 68020 and an FPU, but you'll be happier running it with a fast 68030 and FPU or a 68040 Mac. HiQ also needs at least 5 megabytes of RAM, and you can forget about using virtual memory. In our tests, HiQ was unusably slow at compiling and executing a solver in Virtual Memory mode.

The Bottom Line

HiQ 2.0 handily disproves the big lie that Macs can't do math well. Although it doesn't handle symbolic algebra, it's great at numerical math, easily handling matrix problems and boundary-value problems for differential equations that other math programs find difficult or impossible. Although most Mac users don't have to build and run an ODE model in their work, those who do will appreciate HiQ's combination of number-crunching power, easy scripting, and user-friendly interface. For engineers and scientists, HiQ is a must-buy. / Don Crabb

HiQ 2.0.2

RATING: ★★★★

PROS: Fast. Powerful. Friendly interface.

CONS: Doesn't do symbolic algebra. Not AppleScript-able.

COMPANY: National Instruments, Austin, TX; 800-433-3488 or 512-794-0100.

LIST PRICE: $695.

READER SERVICE: circle #413.

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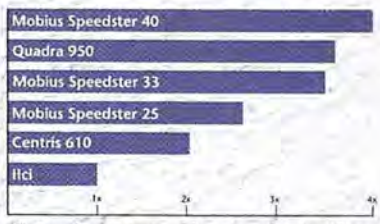

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QuickFLIX! / Fun and affordable

QuickFLIX! puts amateur QuickTime-movie buffs in the director's chair.

BILLED AS PERSONAL moviemaking software, VideoFusion's new, low-cost QuickFLIX! lets amateur film buffs edit their own QuickTime movies. QuickFLIX! skips the advanced digital-editing features of Adobe Premiere and Avid's VideoShop in favor of tools that are simpler to learn and use.

QuickFLIX! is designed to take you through every step of the moviemaking process, from video and sound recording, editing, and special effects to titling, layering, and motion control.

The QuickFLIX! storyboard is where you assemble and arrange your QuickTime movie clips.

To help you edit your movies, QuickFLIX! can display your work in three views. The Storyboard view lets you assemble and arrange clips on a grid. The Time view provides a detailed frame-by-frame display of your movie. The Player view looks like a regular QuickTime-movie window, but it contains all the clips you've pieced together.

Incorporating clips into a QuickFLIX! movie is as simple as opening a QuickTime-movie file and dragging the movie frame to the QuickFLIX! storyboard. From there, you organize and arrange your clips in the order you want them to play.

A QuickFLIX! strength is that the program works much like any standard Mac application. You can cut and paste clips from one storyboard to another, for example. And creating transitions between two clips is as simple as holding down the Shift key, selecting two clips, and selecting an effect in the Transition dialog box.

One of the best features of QuickFLIX! is its titling. With a little coaxing, you can get the program to create titles that fade in and out. It's also surprisingly easy to create flying logos with QuickFLIX!'s layer, motion, and opacity controls. However, creating eye-catching titling effects is a multistep process that can be tricky. If you're not careful, you may even inadvertently delete frames from your movie.

QuickFLIX! is designed for amateur moviemakers, but its storage requirements are major-league. QuickTime-movie files are large — even short movies that run for a few seconds can approach a megabyte in size. And because QuickFLIX! must process your movies when it creates transitions, plan to set aside some time as the program renders wipes and dissolves frame by frame.

The QuickFLIX! manual avoids complicated terminology, which is a plus for novices. A good chunk is devoted to a tutorial that steps users through the process of creating a movie. If you want to go beyond the specific examples listed in the tutorial, however, you may find yourself in uncharted territory. To get a complete grasp of how the program works, plan to carefully read the manual's reference section from cover to cover.

The Bottom Line

For those who don't require the sophisticated features of a high-end video-editing program, QuickFLIX! offers solid editing tools in a user-friendly package. It doesn't let you create complicated video effects or print your movie to tape, but if you're looking for a fairly simple way to assemble QuickTime clips for presentations or just for fun, QuickFLIX! is a good choice. At $149, it's the first affordable entry-level program for casual QuickTime-movie buffs. / Jason Snell

QuickFLIX! 1.0

RATING: ★★½

PROS: Inexpensive. Easier to learn and use than advanced video-editing programs.

CONS: Slow rendering.

COMPANY: VideoFusion, Maumee, OH; 419-891-1090.

LIST PRICE: $149.

READER SERVICE: circle #414.

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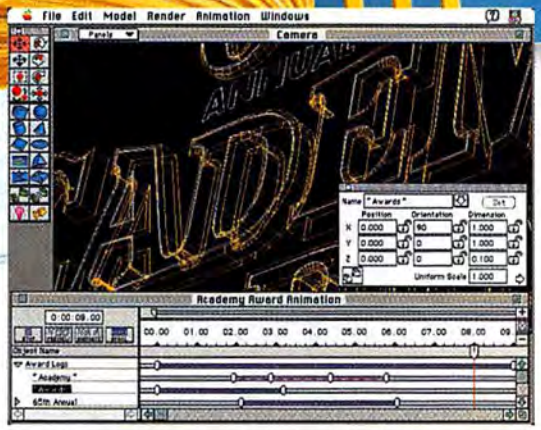

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CIRCLE **57** ON READER SERVICE CARD

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\kə-ˈtas-trə-phē\ *n* **1:** hard drive crash or other disaster resulting in loss of data files

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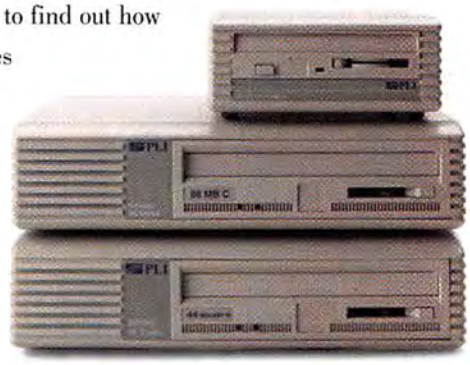

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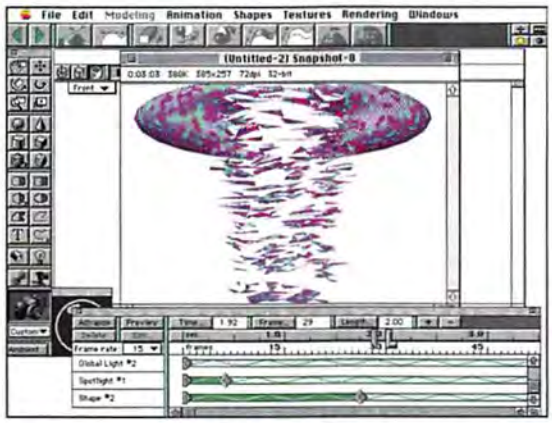
CIRCLE **155** ON READER SERVICE CARD

Strata StudioPro / A one-stop solution for advanced 3-D modeling and animation.

THE 3-D WIZARDS at Strata have conjured up a new modeling and animation tool that's sure to knock the socks off professional designers and animators. Strata StudioPro is a more sophisticated version of StrataVision 3d, the company's first 3-D offering. StudioPro features enhanced modeling prowess and more-extensive animation controls than StrataVision 3d, and it comes with a heftier price tag. However, for those who require excellent-quality photo-realistic rendering teamed with powerful 3-D-modeling tools, StudioPro's price of $1,495 is well worth it.

Digital Sculptures

It's clear that StudioPro's creators focused from the very beginning on enhancing 3-D-design productivity. For starters, despite the addition of new and more-powerful tools, StudioPro works much the same as its predecessor, so StrataVision 3d users will feel right at home with the new software (StrataVision 3d 2.0 users can upgrade to StudioPro for $599). The few subtle interface modifications that are evident in StudioPro are likely to garner only positive reviews from veteran users of StrataVision 3d .



Strata StudioPro outperforms its predecessor, StrataVision 3d, by incorporating more-powerful modeling and animation tools. Shown here is the dazzling Shatter effect, available as an optional plug-in.

StrataVision 3d users will find the biggest difference between StudioPro and its predecessor to be StudioPro's more powerful 3-D modeler. The modeler features the 3d Sculpter tool for free-form object editing, which enables you to quickly create 3-D shapes from 2-D objects. This feature is well implemented and nicely bridges the gap between modeling flexibility and interface accessibility.

You begin by creating a basic object and bringing it into the 3d Sculpter window. Objects you create are spline-based and are equipped with control handles, so you can precisely control the shapes of curves as you edit, or deform, objects. To deform an object, you click on a vertex point or a group of points and drag the points away from the object. The process is much like modeling clay.

To pull points in a specific direction, you can constrain the axis of motion — a key feature for creating complex shapes. A real plus is StudioPro's snappy response during the editing process, which makes it possible to create very complex surfaces in minutes.

The one wrinkle in StudioPro's implementation of the free-form 3d Sculpter is the window's lack of a grid, a crucial aid for creating symmetrical deformations (such as fins on a rocket).

Smooth Operator

Once your free-form 3-D shape is complete, you can choose one of three polygonal mesh densities to smooth the shape's surfaces. The highest mesh density yields a wonderfully silky, smooth surface, although you pay a price in file size and rendering speed.

StudioPro features event-based animation. The animation sequencer window displays a time line for each object in a scene. Event markers, spaced at intervals along the time line, indicate when an object changes. Simply by sliding the markers along the line, you can adjust the timing of each change.

Another helpful animation feature is StudioPro's visible motion paths. You can

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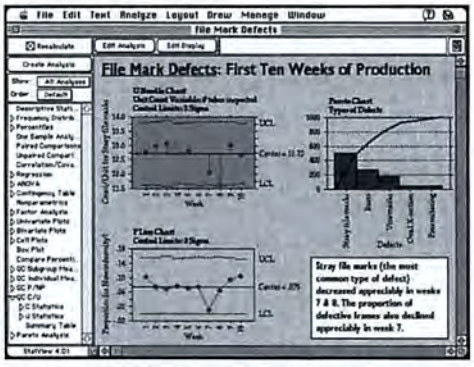
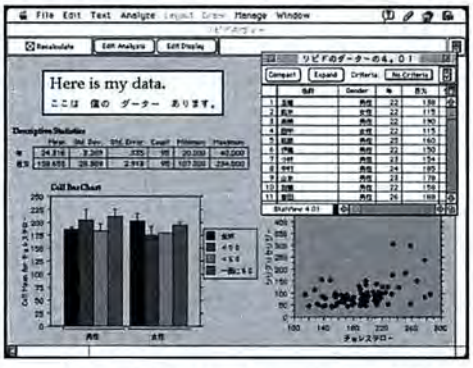
StatView retails for $595 (U.S.), and QC Tools is available for an additional $245 (U.S.). Special StatView 4.0/QC Tools Bundle pricing is available — call us at **1-800-666-STAT** for details.



Like graphical macros, StatView's templates make it easy for anyone — from novices to experts — to perform complex suites of QC analyses and produce high-quality reports.



New Version! StatView 4.01 is 100% WorldScript ready, including support for two-byte languages and right-to-left data entry.

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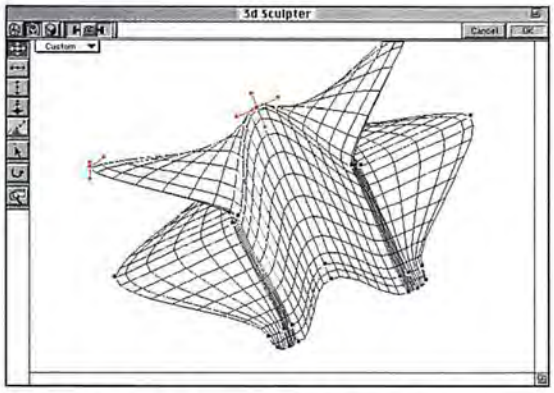

Strata StudioPro's new 3d Sculpter is a free-form modeling tool that enables you to quickly create 3-D shapes from 2-D objects.

view objects' trajectory paths in any active view and edit paths directly as either splines or linear points. That means you can select a single point or group of points and redefine the path simply by dragging — a powerful feature for precise animation control. You can also apply acceleration and deceleration to discrete portions of paths.

In addition, you can convert 2-D objects (including lines, curves, circles, rectangles, polygons, and imported EPS outlines) into motion paths and then move shapes, cameras, and lights along the paths. StudioPro's lighting controls are much more straightforward than StrataVision 3d's, and the program includes a variety of built-in gel effects.

Plug In

The core StudioPro program provides an impressive set of essential and sophisticated 3-D tools, but many additional features are implemented as optional extensions you can plug in as needed. The Bounce extension, for example, automatically creates a realistic bounce motion. Stunning animation effects include the Atomize, Shatter, and Explode extensions. When you apply the Explode effect to a model, StudioPro disconnects the polygons that comprise the model and causes them to fly apart. Adjustable spin entropy provides limited control over the polygons as they move away from the model's center.

Textures are also included as extensions. New mapping controls make it much easier to position textures on surfaces with StudioPro than with StrataVision 3d. The mapping dialog box displays a helpful preview of a texture as you've mapped it to an object. Mapping a texture to an object is as simple as dragging the texture from a palette to the object. Unfortunately, StudioPro doesn't provide a feature equivalent to Infini-D's Surface Composer, which is useful for combining multiple texture maps on a single object.

Also worth noting is the $69 MultiMorph module, which boasts the nicest animated texture dissolve we've seen for the Macintosh. The module also provides particle morphing, which causes objects to break apart and then reassemble as new objects.

StudioPro's rendering speed and quality are both impressive. StudioPro rendered our images in about half the time required by StrataVision 3d 2.6.1. Ray-tracing a scene with maximum anti-aliasing took about a third as long with StudioPro as with StrataVision 3d. A new rendering mode, called RayPainting, mimics traditional media such as watercolor and chalk and applies the effects so they conform to object shapes.

Strata's network rendering software, RenderPro, was not compatible with StudioPro at press time, a consideration for StrataVision 3d users currently taking advantage of network rendering.

StudioPro comes with a comprehensive manual and a CD-ROM full of sample models and textures. The documentation clearly assumes some experience with 3-D tools (a good step-by-step tutorial is noticeably absent).

The Bottom Line

Professional artists and designers who are looking for a one-stop 3-D application that includes excellent modeling tools, advanced animation features, and photo-realistic rendering can't go wrong with Strata StudioPro. / David Biedny

Strata StudioPro 1.0

RATING: ★★★★½

PROS: State-of-the-art modeling tools. Photo-realistic rendering.

CONS: Lack of modeling grid.

COMPANY: Strata, Inc., St. George, UT; 800-869-6855 or 801-628-5218.

LIST PRICE: $1,495.

READER SERVICE: circle #415.

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RasterOps DuoMates and E-Machines PowerLink Presentor / Take the show on the road with three new video docks.

MacUser Labs

POWERBOOK DUO OWNERS can take their presentations to the big screen by teaming their Duo with a portable video dock. A video dock lets you connect your Duo 210 or 230 to a wide variety of large-screen monitors, making it an ideal accessory for mobile presenters. RasterOps makes two models — one with 8-bit-color support and one with 16-bit-color support. E-Machines' dock, the PowerLink Presentor, provides 8-bit-color support and comes with the added advantage of composite-video (NTSC and PAL) support, so in a pinch, you can use a TV to display your presentation.

RasterOps DuoMates 8, 16sc

The RasterOps DuoMate 8 is designed for budget-conscious Duo owners. Priced at $499, the DuoMate 8 provides 8-bit-color support for monitors as large as 21 inches. In addition to a 15-pin video connector, it comes with ports for audio output, RGB video, ADB, and a high-density-floppy-disk drive. Because both DuoMates fit over the Duo's power port and power button, each provides a replacement power port and a power button.

For a little more money, you can buy a $649 DuoMate 16sc, the only docking station currently available that provides 16-bit-color support for 14-inch monitors (it also supports 8-bit color for monitors as large as 21 inches). In addition to having all the ports provided by the DuoMate 8, the DuoMate 16sc also comes with a standard 25-pin SCSI connector, so you can chain as many as six SCSI devices to the Duo. The combination of 16-bit-color support and the ability to connect a hard drive to the Duo will be especially welcome to those who plan to incorporate QuickTime movies into their presentations. Moreover, with all of its functions, the DuoMate 16sc transforms your Duo into a complete desktop machine.

The speed of scrolling and zooming operations with the DuoMate 8 was largely on a par with that of the Apple Duo Dock in 8-bit-color mode. Operations with the DuoMate 16sc were generally slower than with the Apple dock by 15 to 30 percent when running in 16-bit-color mode.

At 1 pound each, the RasterOps docks are light, but they aren't nearly as compact as the E-Machines PowerLink Presentor. To install a DuoMate, you simply snap the dock into the back of your Duo. The software consists of a control panel you install in your System Folder. The DuoMates automatically configure themselves to work with any Apple-supported or RasterOps monitor. Manual setup is provided for displays that don't autoconfigure. Your Duo's screen continues to be active after you've connected the dock to an external monitor.

The DuoMate software provides zoom and pan features and allows you to control image centering for the external display. In addition, you can align the two display icons in the control-panel window to correspond to the external monitor's screen position

E-Machines' slim, trim video dock, the PowerLink Presentor (right), lets you connect your Duo to a TV set as well as to large-screen monitors. The RasterOps DuoMate 16sc (left) features 16-bit-color support for 14-inch monitors as well as a 25-pin SCSI connector.

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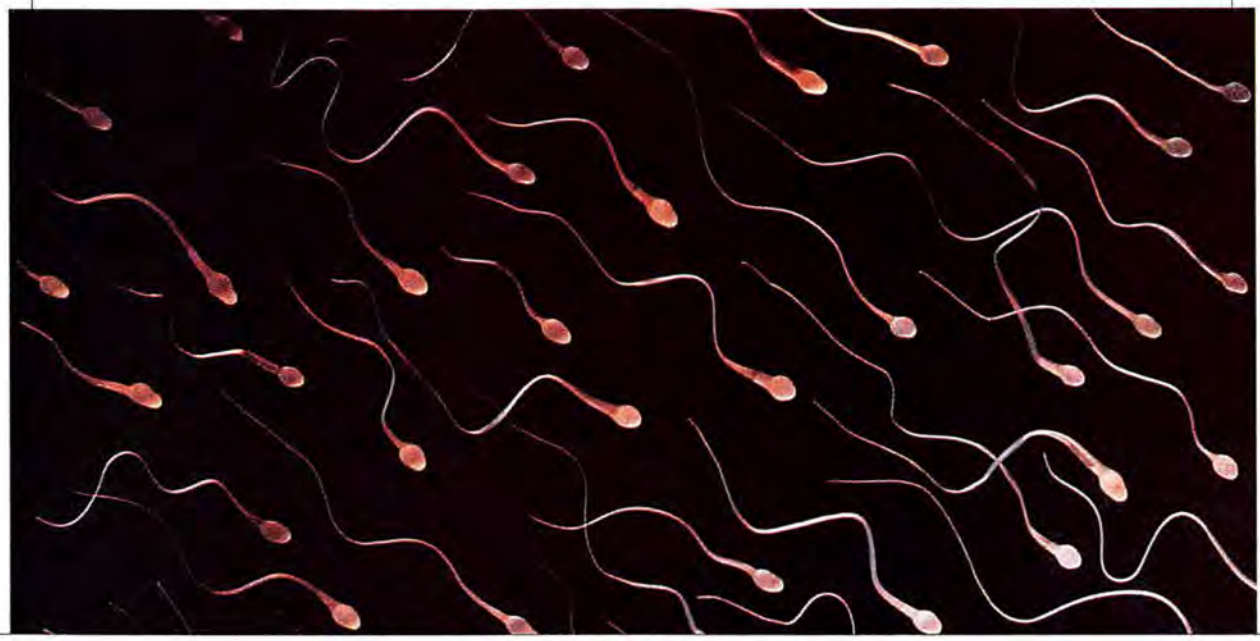

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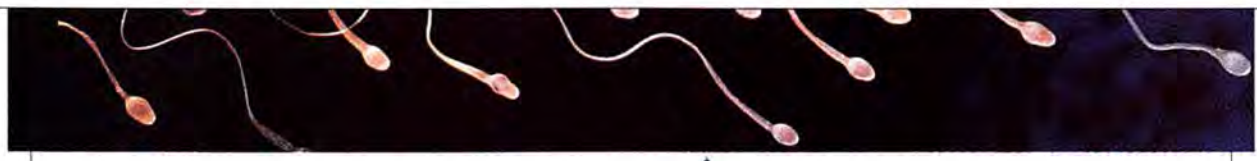

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relative to the Duo's screen, so that you can move the cursor smoothly between the two screens.

You can also specify which screen is to be the main display (the one that displays the menu bar) as well as enable video mirroring, a useful feature when you need to perform the same functions on the Duo screen as on the external display. However, expect some performance degradation with video mirroring; this is true for the RasterOps as well as the E-Machines docks.

The DuoMate 16sc software also lets you control SCSI Disk Mode, which enables you to mount the Duo's internal disk as a volume on a desktop Mac for fast file transfers.

E-M PowerLink Presentor

The $499 E-Machines PowerLink Presentor is nearly as svelte in design as the Duo itself. Measuring a slim, trim 6.5 inches long, 3 inches wide, and 1 inch high, the dock slips easily into a jacket pocket. The PowerLink Presentor is equipped with ports for RGB video, composite video, a power adapter, a floppy drive, ADB, and audio out. The composite-video port gives the dock its most attractive feature: support for a TV as an external display system. In our tests, the PowerLink Presentor's video-smoothing option worked well to reduce the flicker common to computer graphics displayed on a TV.

The most unattractive aspect of the PowerLink Presentor is that it fits over the Duo's power button and power port, but unlike the DuoMates, it doesn't provide a replacement power button. If your system crashes, you may be able to reset the Duo with the Control–Command–power-on-key combination, but in some cases, you have to pull the dock from the Duo while the Duo is still powered up. The PowerLink Presentor's manual explicitly recommends against removing the dock unless the Duo is in Sleep mode or shut down.

The PowerLink Presentor supports 8-bit color on monitors as large as 16 inches and 4-bit color on 19-inch monitors. In our speed tests, scrolling and zooming with the PowerLink Presentor proved to be slightly slower overall than with the DuoMate 8.

Installation is straightforward. As with the DuoMates, the dock simply snaps into the back of the Duo. An installer places a control panel in your System Folder. Also similar to that of the DuoMates, the PowerLink Presentor software automatically configures the dock to work with any Apple-supported or E-Machines monitor.

Software controls let you zoom and pan, adjust screen brightness and contrast, set keyboard shortcuts, opt for large menu-bar fonts, and activate a cursor tracker.

The Bottom Line

If you're a PowerBook Duo owner who frequently travels to give business presentations, a portable video dock is a worthwhile addition to your mobile office. If you don't mind the bulk of the RasterOps DuoMate docks, you'll find the DuoMate 8 is easy on the budget. The DuoMate 16sc's SCSI connector is a real plus that can transform your Duo into a fully functional desktop machine.

The E-Machines PowerLink Presentor is small enough to slip easily into a jacket pocket, and it's the only video dock that supports composite video for TV display. / Susan Janus

Paul Freedman of ZD Labs managed the testing for this review.

E-Machines PowerLink Presentor

RATING: ★★★½

PROS: Compact. Composite-video support.

CONS: Lack of replacement power button.

COMPANY: E-Machines, Sunnyvale, CA; 800-541-4787 or 408-541-6100.

LIST PRICE: $499.

READER SERVICE: circle #416.

RasterOps DuoMate 8

RATING: ★★★

PROS: Low cost. Support for 21-inch monitors.

CONS: Bulky. Lack of composite-video support.

RasterOps DuoMate 16sc

RATING: ★★★½

PROS: 16-bit-color support. SCSI connector.

CONS: Bulky. Lack of composite-video support.

COMPANY: RasterOps, Santa Clara, CA; 800-729-2656 or 408-562-4200.

LIST PRICE: DuoMate 8, $499; DuoMate 16sc, $649.

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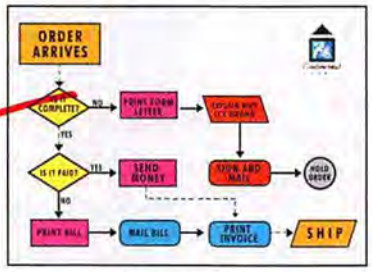

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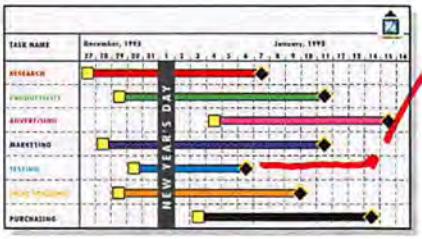

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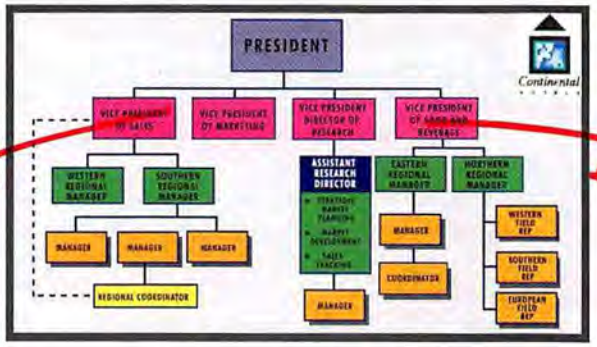

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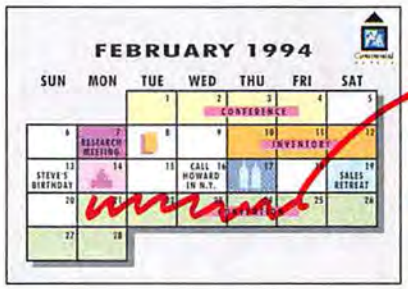

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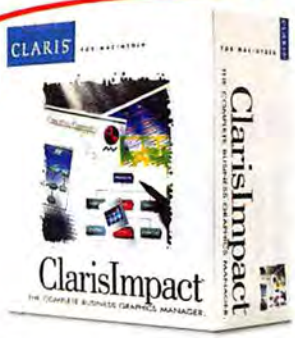

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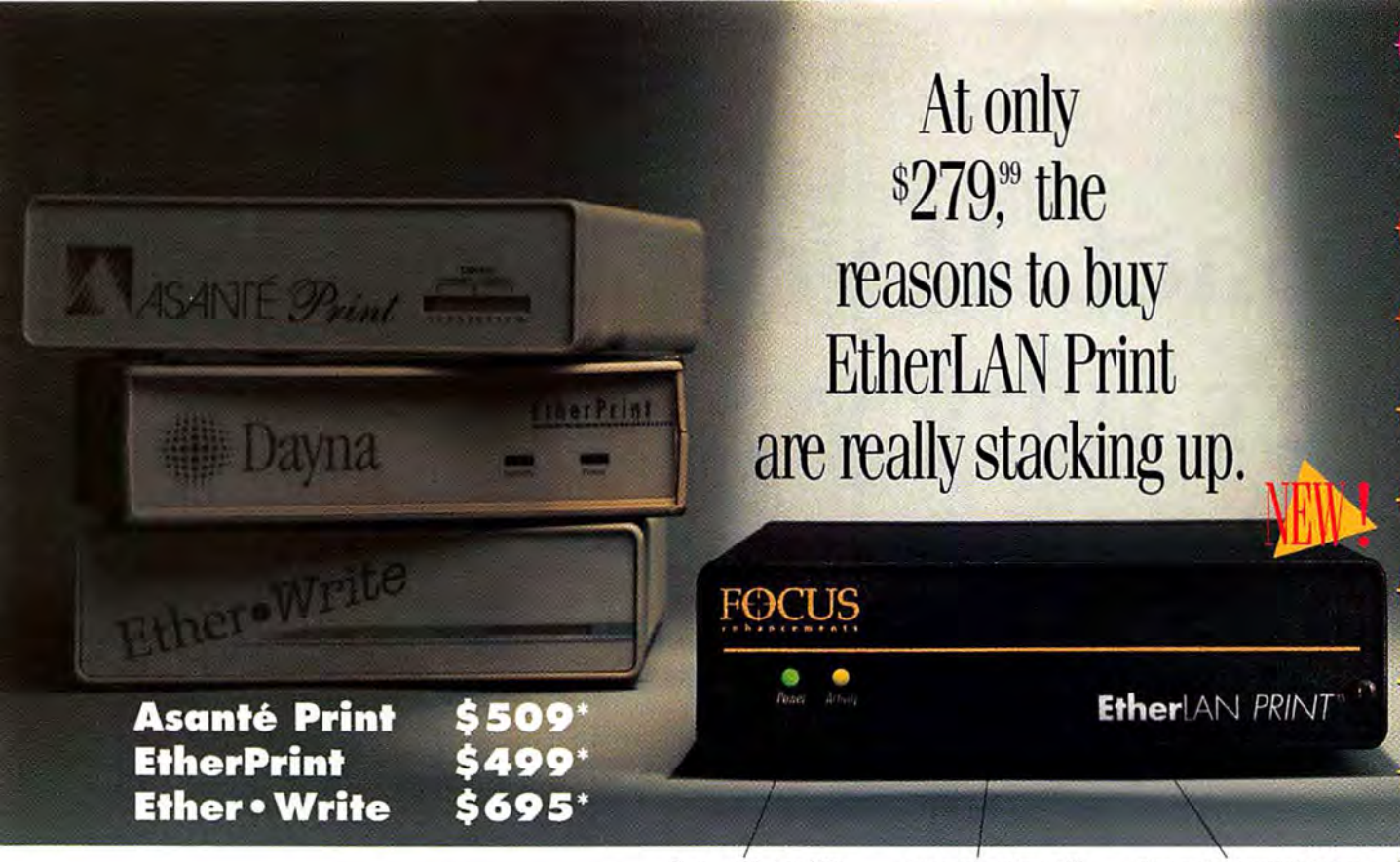

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Myst / Mysterious virtual world on CD-ROM

HOW WILL THE INTERACTIVE virtual-reality entertainment of the future work? Possibly something like Myst, the absorbing new CD-ROM adventure game from Cyan (published by Brøderbund). Like Cosmic Osmo and other Cyan projects, Myst presents an ingeniously constructed world for you to explore, but it goes further: Its world is composed of stunningly rendered, 3-D color images (2,500 of them) cleverly interspersed with QuickTime movies; it features highly realistic ambient sounds; and — best of all — it has a plot.

Exploring a Mystery. In Myst's opening sequence, you click open a book, fall into its pages, and become immersed in an island world. You begin clicking your way around the island, making choice after choice about which direction to go or look (forward, backward, right, left, and sometimes up or down) and attempting to manipulate objects. It's not quite virtual reality, because you're limited to choosing from a set of predetermined paths and views, but the views and sound effects are so realistic that it's easy to believe you're really there — on a wave-slapped dock, in a sun-streaked forest, or inside a grisly secret chamber. You sense that something terrible has happened to the former inhabitants of Myst. Bit by bit, you piece together clues and find yourself on a quest, solving a long series of puzzles before you finally unlock Myst's story.

Provoking Puzzles. The puzzles can be tough, but they're basically fair — except that they sometimes involve too much repetitive traveling. Many puzzles are gadgets that affect something out of view, so you click your way back and forth between the gadget and the thing it affects until you learn how to work the mechanism correctly. Although the Zip mode cuts down on travel time to *visible* destinations, it doesn't help much when you can't see the destination you want. A simulator that lets you practice how to work one of the gadgets (a rotating fortress) is a step in the right direction, but in version 1.0, the fortress doesn't work like the simulator (be sure you get a copy of the bug-fixing patch, available from on-line services or directly from Brøderbund tech support). What's more, you still need to travel between the simulator and the actual fortress controls. A tool for jumping quickly to familiar destinations would be a welcome addition, as would an electronic notebook (rather than the paper one provided) for recording information that may be useful later. Yes, we know such tools might detract slightly from the illusion of real life, but we'd gladly trade away the boring, repetitive part of real life too.

Myst can be frustrating at times, but it's always fully engaging. Its dazzlingly imagined worlds, maddening puzzles, and mysterious plot can easily swallow you for days or weeks. Our advice: Take along your significant other, or you'll be sorely missed. / Karen J. Ohlson

Myst ★★★★½ / COMPANY: Brøderbund Software, Novato, CA; 415-382-4400. VERSION: 1.0. LIST PRICE: $59.95. READER SERVICE: circle #418.

LightningScan Portable / Have scanner, will travel

IF YOU'VE EVER WISHED you could scan information into your PowerBook instead of copying it manually, you'll be interested in the LightningScan Portable, from Thunderware. It's a complete scanning package for any PowerBook with at least 2 megabytes of available memory (4 megabytes for optical character recognition) running System 7. The handheld scanner measures 6 x 5.5 x 1.5 inches and connects to its interface box (7 x 3.5 x 1 inches), which plugs in to a Mac serial port.

Half Hour of Power. The NiCad battery in the scanner's interface box provides 25 minutes of actual scanning time (enough for quite a few pages) and then takes five to six hours to recharge with the included AC adapter. A DA monitors remaining power but doesn't indicate whether the battery is properly charging, and the ThunderWorks image-editing application refuses to scan if it detects low battery power — even when it's connected to a wall outlet.

Flat-Surface Scanning. Scanning involves a bit of setup and a modicum of dexterity. You set switches for resolution (from 100 to 400 dpi) and the type of image being scanned (three settings for gray scale, one for black-and-white) and adjust the brightness knob. Then you open ThunderWorks and acquire the scan by holding down the Start button and rolling the scanner along a plastic, 13-inch straightedge (which lacks ruler marks on top and antiskid padding beneath). Although you can see the original through a window and a light blinks if you roll too fast, maintaining a straight path and consistent speed can be difficult — especially if your original isn't a single piece of paper on a flat, uncluttered work space.

Some Software Advantages. The LightningScan Portable is only a 1-bit scanner, but the ThunderWorks application creates as many as 37 levels of gray through pixel averaging (at the expense of resolution), and you can edit the gray-scale images on a monochrome monitor. ThunderWorks' best feature is its ability to piece together a full page by joining 4.2-inch swaths with minimal distortion. The other editing functions are rudimentary or clumsy; most users will prefer to use LightningScan's plug-in module to scan into a dedicated graphics program such as Photoshop.

Olduvai's Read-It OCR Personal 3.0 optical-character-recognition software is included for converting bit-mapped images into editable text. We've found that using a handheld scanner for OCR is more trouble than it's worth, though, unless you have a perfect original, fine motor skills, and the patience to edit the scanned text.

Most of the shortcomings we've mentioned are shared by other handheld scanners, so if you don't mind toting 1.5 pounds of extra equipment (with no protective case), this scanner's a decent tool for quick-and-dirty image acquisition on the road. If image quality and OCR are important to you, though, consider sacrificing portability for a deskbound flatbed scanner. / Owen W. Linzmayer

LightningScan Portable ★★★ / COMPANY: Thunderware, Inc., Orinda, CA; 800-628-0693 or 510-254-6581. VERSION: 1.3.3. LIST PRICE: $389. READER SERVICE: circle #419.

Hello! Music!, SC-7 Sound Module, and SoundEngine Music Module / Create and play easy-to-share General MIDI sequences

IF YOU'RE A MAC MUSICIAN interested in sharing MIDI sequences, the new General MIDI (GM) standard will make your life easier — as will GM-supporting hardware/software packages such as Yamaha's Hello! Music!, Roland's SC-7 Sound Module, and E-mu Systems' SoundEngine Music Module. Because GM standardizes the way sounds are assigned to channels, you can develop sequences that sound pretty much the same on any GM system. You can also play and edit commercially developed GM sequences.

Package Deals. Each of these packages includes a GM *module* — essentially a GM-compatible synthesizer without the keyboard. You also get sequencing software, a modular power supply, and a serial cable for connecting the module to your Mac. Each module has at least one audio input (the SC-7 module has two) for mixing another sound source with the MIDI output. Special switches on the Roland and Yamaha modules let you use them with PCs as well as Macs.

Hello and Goodbye. Mediocre sound quality, outdated software, and a midline price make the Hello! Music! our third choice. The sound of the Yamaha CBX-T3 module is well balanced but lacks presence. The sequencing software, Passport Design's Turbo Trax (included along with Passport's MIDI Player, a software MIDI jukebox), is easy to use but lacks essential features such as background play and graphic editing of controller data; also, it doesn't give you direct editing access to GM parameters such as reverb type.

The Bargain SC-7. Bright and well-balanced sound, decent software, and an excellent price make the Roland SC-7 Sound Module a bargain. Because most current commercial GM sequences were created with Roland's higher-end Sound Canvas module, they also sound quite good with the SC-7. The bundled Ballade software, from Dynaware, gives you all the tools you need to control basic GM functions and record and play, although the software's notation-editing functions aren't extensive. Also included is PG Music's Band-in-a-Box, a "music minus one" accompaniment program.

The Deluxe SoundEngine. Superior software and hardware — at a higher price — make the SoundEngine a good choice for musicians looking for a more varied sound palette than the SC-7 offers. The SoundEngine is the only GM device we reviewed that has a serial-through port, so you can attach another serial device after the SoundEngine. The SoundEngine also includes the most-useful software programs, both from Opcode: EZ Vision is a nice entry-level sequencer that employs the conventional piano-roll editing interface; Edit One, a separate sound-library program, lets you edit basic GM parameters. For an extra $49.95, you can obtain an upgrade to Edit One that allows more-extensive editing of the SoundEngine's voices. These voices are the most realistic and varied we heard, although you may need to do some level tweaking on the ensembles in commercial sequences, which often tend to be out of balance. / Christopher Breen

Hello! Music! ♦♦♦ / COMPANY: Yamaha Corp. of America, Buena Park, CA; 714-522-9011. LIST PRICE: $449. READER SERVICE: circle #420.
SC-7 Sound Module ♦♦♦♦ / COMPANY: Roland Corp. U.S., Los Angeles, CA; 213-685-5141. LIST PRICE: $399. READER SERVICE: circle #421.
SoundEngine Music Module ♦♦♦♦ / COMPANY: E-mu Systems, Inc., Scotts Valley, CA; 408-438-1921. LIST PRICE: $595. READER SERVICE: circle #422.

Crystal Crazy / Arcade madness to the max

CRYSTAL QUEST FANS WILL GO CRAZY with all the fun new elements in the game's successor, Crystal Crazy. Building on Crystal Quest's familiar plot (stay alive, pick up crystals, rack up points, and shoot things), Crystal Crazy adds new bad guys (from peripatetic cuspidors to mutant Dumples with detachable, lethal eyes); special weapons; and handy shields, such as a rubber hat that gives you bounce-ability. Plus, after every three levels, you now get a bonus round in which you can tear around and pick up points, extra lives, and weapons — as many as you can grab before the walls move in on you.

Few Drawbacks. Drawbacks are few and minor: an initially amusing time-bonus screen that gets old because it slows the game down and some strange memory messages (on our 4-megabyte Classic, at least) that we handled by closing other applications or zapping the PRAM.

Tips for Pros. When you get really good (as you will, once you get addicted), a full game takes a long time — and if you save it, it's marked as a game in which you needed a rest. Fortunately, you can avoid this badge of dishonor by pausing the game for as long as you want — if your cat will stay away from the keyboard. / Louise Kohl Leahy

Crystal Crazy ♦♦♦♦ / COMPANY: Casady & Greene, Salinas, CA; 408-484-9228. VERSION: 1.0.2. LIST PRICE: $49.95. READER SERVICE: circle #423.

Final Draft / Easy script formatting

FINAL DRAFT OFFERS SCREENWRITERS all the functions of a word-processing program while eliminating all the formatting hassles specific to screenwriting. Its built-in macros let you apply standard script styles or type common phrases (such as "CUT TO:") with just a couple of keystrokes. The program also lets you easily mark changes as a script goes through the revision process, showing revisions in red type on-screen and marking them with asterisks in the right margin if you choose. In addition, Final Draft takes care of page breaks (automatically inserting *continued* where required) and scene numbering or renumbering — unless you lock your file, which allows you to add text and scenes without changing scene numbers or page breaks.

Word Processing Too. Final Draft's word-processing features are quite complete. The program includes a spelling checker, a thesaurus, a print-preview mode, and even an annotations option. Although a few of the features are awkward to use — it's not as easy as it should be to reformat sections of text, for instance — most perform as smoothly as the features in mainstream word processors. Final Draft supports Microsoft's RTF (Rich Text Format), so you can exchange files easily with other word processors that support RTF.

Final Draft costs about as much as full-fledged word processors, but it saves you enough time that it's money well spent — especially if you sell your script. / Jason Snell

Final Draft ♦♦♦♦ / COMPANY: MacToolkit, Santa Monica, CA; 310-395-4242. VERSION: 2.0. LIST PRICE: $349. READER SERVICE: circle #424.

Paint Alchemy / Startling, brush-based special effects

PAINT ALCHEMY GIVES your Photoshop-filter-compatible applications the power to transmute any RGB image into a stunning array of brush strokes. Paint Alchemy-filtered images have a distinctive, organic look you can't create any other way — not on a Mac, at least. Xaos (pronounced "chaos") has used this algorithmic paintbrush technology for years in its high-end animation production work as well as in a pricey special-effects animation package called Pandemonium, which runs on Silicon Graphics machines. Now, by putting the technology into a plug-in filter, Xaos has made it accessible to mainstream Mac applications such as Adobe's Photoshop and Premiere, Fractal Design's Painter, VideoFusion's VideoFusion, and CoSA's AfterEffects.

Powerful Brush Controls. Paint Alchemy's power lies in the sophisticated control it gives you over five basic brush attributes (color, size, angle, transparency, and brush shape) and in its ability to alter these attributes based on the values of pixels in the image — for example, using larger brush strokes for cool hues than for warm hues. You specify combinations of brush controls in five simple screens called Control Cards; when you create a combination that you particularly like, you can save it for subsequent use. The standard package includes 75 preset styles (such as Vortex, Threads, and Spatula); a floppy disk called Floppy Full of Brushes, which contains 50 additional brush shapes, costs $19.95. You can also use any gray-scale image as a basic brush shape.

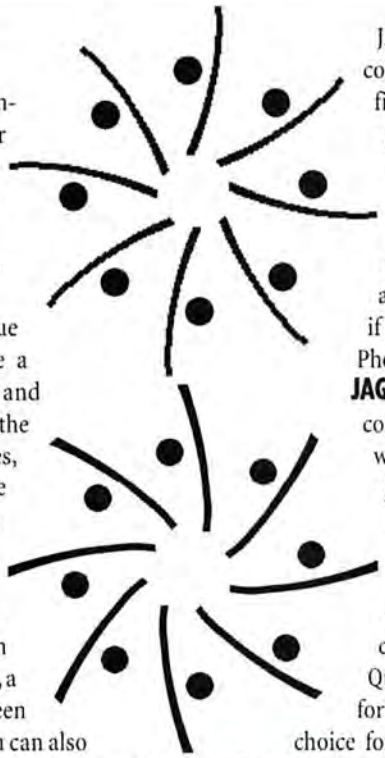
Animated Brushwork. Video and animation fans, take note: Paint Alchemy's most dazzling effects result from using it with QuickTime movies (or other types of animation files). When you type *13* into the randomization-seed setting on the Brush Control Card, Paint Alchemy randomizes the brush seed applied to multiple animation or QuickTime frames, yielding incredible animated brush effects — you get brush strokes *wriggling* with life.

No Speed Demon. Paint Alchemy's greatest drawback is its slowness: This is a power-hungry filter. The first release lacked support for the Mac's math coprocessor, greatly crippling overall speed — on a Quadra 950, it took more than two minutes to process a 1-megabyte RGB file. At press time, Xaos shipped a free update that uses the FPU and significantly speeds things up (to an average of 90 percent faster than with the non-FPU version), but the update is still no speed demon, as filters go. Another limitation is that the filter works only in RGB mode; it can't directly process gray-scale or CMYK images.

Regardless of its less-than-blinding speed, Paint Alchemy is a dazzling addition to any image-processing toolbox. If you're looking for delicious eye candy, look no further. / David Biedny

Paint Alchemy ★★★★ / COMPANY: Xaos Tools, San Francisco, CA; 415-487-7000. VERSION: 1.0.1. LIST PRICE: $99; 50 add-on brushes, $19.95. READER SERVICE: circle #425.

JAG II / Shed the jagged edges from your images



WE'VE ALL SEEN THOSE telltale jaggies in an image — the stairstep edges that scream "computer generated!" JAG II not only eliminates the jaggies (as its predecessor, JAG, did) but it also adds new capabilities for boosting the resolution of black-and-white images and includes new filtering capabilities for color images.

Better Black-and-White. JAG II uses a technique called *resolution boosting*, which lets it take a MacPaint-style black-and-white 72-dpi image and enlarge it to 300 dpi. Although they aren't perfect, the results are surprisingly good. On complex images, such as black-and-white woodcuts, this technique provides better results than any auto-tracing program could, and in less time: The process takes only a couple of minutes.

Color Tricks. JAG II's tools for smoothing the edges of color images haven't changed greatly in this version. The program still uses anti-aliasing, a technique that applies intermediate colors between regions of great color contrast. Now, however, you can also scale an image to a particular size while you apply anti-aliasing. The results, although not spectacular, are at least as good as what you get from Photoshop. (No Mac program can enlarge a color image without blurring it and creating artifacts.)

JAG II also allows you to apply Photoshop filters to color images. It uses virtual memory to process files that are too large to fit into memory, and it can process them in the background. JAG II comes with two filters: Kai's Sharpen Intensity (from Kai's Power Tools) and Aldus' Gallery Effects Sampler. A Photo CD-acquire module that enables JAG II to read Photo CD images directly is also included. This feature is particularly helpful if you don't have Photoshop or a program that runs Photoshop filters.

JAG II's Jaggies. Unfortunately, JAG II doesn't let you copy and paste between images or crop an image — which means that you have to do some basic image processing in another program. Also, the original release of JAG II was somewhat buggy, so make sure you get the upgrade to version 1.02.

JAG II remains a good value for animators and 3-D artists wanting to save time — especially now that the program can process QuickTime files. With its new resolution boosting for black-and-white images, JAG II is also a good choice for those who want better laser-printer output. / Sean Safreed

JAG II ★★★½ / COMPANY: Ray Dream, Inc., Mountain View, CA; 800-846-0111 or 415-960-0768. VERSION: 1.02. LIST PRICE: $129. READER SERVICE: circle #426.

DeskTape / Mount DAT on your desktop

DRAWN TO DAT (digital audiotape) for portable gigastorage but apprehensive about inconvenient data access? Here's good news: Optima's DeskTape, which lets you mount a DAT cartridge directly on your Mac's desktop, is now available as a stand-alone product that works with any DDS/SCSI-2-compatible DAT drive (versions for Exabyte tapes, quarter-inch cartridges, and Teac drives are also available). You can browse the contents of a tape, drag and copy files, and even play QuickTime movies — operations unheard of before DeskTape. DeskTape also lets you write to tapes, providing a useful format for transporting large files; for read access, the recipient need install only the DeskTape control panel, rather than the entire DeskTape application.

Pseudo-Random Access. DeskTape provides its illusion of immediate file access by keeping a copy of the tape's directory on your startup drive (where it uses 2.5 megabytes or more of contiguous space), but it can't provide the quick access times you get with a hard drive, because tape doesn't allow random information access. You can browse the contents of the tape, but opening subsubfolders can take several seconds. Running an application from the tape is painfully slow, as is editing a tape-based document — you're better off editing it on your hard disk. And if your tape contains many files, mounting a DeskTape cartridge isn't as fast as mounting a removable cartridge.

Nonoptimal Sharing. Sharing a DeskTape volume over a network isn't advisable, because users can become disconnected while the tape shuttles frantically, trying to accommodate several requests at once. However, you *can* use DeskTape for network backup, in a pinch, by having the remote stations share their volumes with the local DeskTape volume, which then handles the backup operations. Version 2.0 of DeskTape, expected soon, will make backup easier.

Although it carries limitations intrinsic to streaming-tape technology, DeskTape makes those gigabytes of DAT storage much easier to access. If you regularly lug stacks of SyQuest cartridges to a service bureau, you're a DeskTape candidate. / Jeffrey K. Milstead

DeskTape ★★★ / COMPANY: Optima Technology Corp., Irvine, CA; 714-476-0515. VERSION: 1.6. LIST PRICE: $299. READER SERVICE: circle #427.

Now Fun! / Liven up your desktop

ANY PROGRAM WITH THE WORD *FUN* in its name has a lot to live up to. But Now Fun!, a collection of five control panels from Now Software, provides enough desktop-livening action that you're sure to find something worthy of the name.

Screen Beautifiers. Fun Screen Savers, similar to After Dark, includes more than two dozen screen-saver modules, ranging from ho-hum to awesome, plus a game — Xeno Blaster — that we liked even better than More After Dark's Lunatic Fringe. Fun Screen Savers can also use most After Dark and More After Dark modules.

Fun Pictures lets you replace your desktop pattern with any PICT, EPS, GIF, MacPaint, or Wallpaper picture or pattern. Like Thought I Could's Wallpaper, it can display repeating patterns on your desktop. But unlike Wallpaper, Fun Pictures allows pictures of any size (not just 128 x 128 pixels) and lets you arrange multiple pictures on your desktop, although multiple-*color* pictures tend to slow your Mac appreciably.

Zounds of Sounds. Fun Sounds, like the shareware program SoundMaster or Nova's Kaboom!, lets you assign sounds to Mac events such as emptying the Trash or inserting or ejecting a disk. It includes more than 100 sounds of varying quality and usefulness.

Cursors and Colors. Fun Cursors is similar to the freeware control panel CursorAnimator. It lets you replace your cursors — the arrow, the beach ball, the cross hair, and so on — with colorful animated cursors. Choose from more than 70 included cursors, or use the cursor editor to create cursors from scratch. Likewise, Fun Colors lets you create your own color sets (for the menu bar, windows, buttons, and text items) or choose from more than 30 designer sets.

Now Fun! is a comprehensive collection of enjoyable customization tools. The modules are on a par with their stand-alone competition, and the price can't be beat. / Bob LeVitus

Now Fun! ★★★½ / COMPANY: Now Software, Portland, OR; 800-938-8669 or 503-274-2800. VERSION: 1.0. LIST PRICE: $69. READER SERVICE: circle #428.

Hell Cab / Infernal CD-ROM adventure

IT'S REFRESHING TO SEE the old pact-with-the-devil concept exploited with as much panache as it is in Hell Cab, a new game on CD-ROM.

A Faustian Bargain. Raul, New York Cab Driver from Hell, offers you a cab ride from the airport to the Empire State Building — but it turns out you haven't got the fare. Raul offers you a time-travel tour with stops in Nero's Rome, a Jurassic jungle, and elsewhere. If you return from any stage with your life and soul intact, plus cab fare, Raul will drive you back to the airport; otherwise, you go to h-e-double hockey sticks.

Soul-Saving Strategies. Hell Cab presents you with tough choices. Lingering in any one stage is bad, because Raul's taxi meter is constantly running, but every nasty thing you do to try to escape causes your soul to dwindle, as measured by an on-screen Soul Meter. Also, the game isn't very directive, so you can choose how hard you want it to be. Technically, you can win just by entering the fun-to-explore Empire State Building, making an ATM withdrawal, and then returning to the cab, but it's much more interesting if you play to lose.

Hellish Hang-ups. Hell Cab is sometimes hamstrung by poor attention to details. In Rome, for instance, a Gauntlet of Death requires you to press one of three steel pads. Only one lets you pass safely, but you get no clues as to which one — and it's randomized every time you play the game. The few arcadelike scenes are also frustratingly slow, because the game was created with Macromedia Director (soon, a faster version of the game will exploit QuickTime 1.6).

Still, Hell Cab is hella fun. It also teaches you an important lesson: All the money in the world don't mean a thing if you ain't got soul. / Andy Ihnatko

Hell Cab ★★★★ / COMPANY: Time-Warner Interactive Group, Burbank, CA; 800-593-6334 or 818-955-9999. VERSION: 1.0.1. LIST PRICE: $99.99. READER SERVICE: circle #429.

KaleidaGraph / Serious, nontrendy graphing and analysis

KALEIDAGRAPH 3.0, SYNERGY SOFTWARE'S new upgrade of its graphing and data-analysis package, spurns the trendy pictographs, gradient backgrounds, and slide-show capabilities of mainstream business charting programs. Instead, it provides a tool of astounding depth for scientists, engineers, and financial analysts.

Impressive Importing. KaleidaGraph's depth is apparent from the start, when you begin importing data. Spreadsheet- and text-data import are de rigueur for any graphing program, but KaleidaGraph adds filtering capabilities so you can easily access large data sets downloaded from mainframes and on-line services. A text preview shows the first few lines of the file and lets you specify exactly which lines and fields to read or skip. Version 3.0 adds publish-and-subscribe capabilities for linking to external data sources or destinations.

Deluxe Data Analysis. After you've entered data into KaleidaGraph's huge datasheet (as many as 256 columns and 32,000 rows), you can manipulate it every which way. You can mask and unmask specific cells, perform multilevel sorts, and have KaleidaGraph automatically divide data into bins for a histogram. A formula editor provides logical and matrix operators, statistical functions, curve fits, and more. To reuse multiline formulas, you can save them as macros.

Lots of Plots. Naturally, KaleidaGraph lets you create many types of *plots* (Synergy's term for graphs or charts). Its 16 primary plot types range from the usual line, bar, and pie plots to polar, probability, high-low, and box plots. To abet your plotting, the program includes excellent manuals; extensive on-line help; style sheets; plot templates; a robust table-creation tool; and a Plot Scripts command, which lets you automate the entire plotting process — an especially powerful feature when combined with publish-and-subscribe.

You can customize every element of a plot, from axis formulas to legends, arrowheads, and line styles. A page-layout feature lets you arrange multiple charts on a page along with imported graphics (EPS or PICT), titles, tables, and summary statistics. Other customizing tools include a 256-color palette, basic drawing and layering tools, fill patterns, and a text tool.

Journal-Quality Output. Synergy calls KaleidaGraph's output "journal quality" — in other words, you don't get deluxe-output options. You can print plots to any desktop printer, but there is no built-in support for film recorders. Although you can import beautiful backgrounds and customize colors and fills, this is a QuickDraw program. As such, it lacks the PostScript features of programs designed for presentation graphics, although you can embed PostScript code to output to PostScript printers.

For a fancy color-presentation package, look elsewhere. But for data-intensive graphing, scientific chart types, and data manipulation, KaleidaGraph 3.0 is at the top of the heap. / Becky Waring

KaleidaGraph ★★★★ / COMPANY: Synergy Software, Reading, PA; 215-779-0522. VERSION: 3.0. LIST PRICE: $249; upgrade, $35. READER SERVICE: circle #430.

Shoebox / Catalog images for easy retrieval

THE NAME OF THE LATEST ENTRY in the image-database market may evoke closets full of unmounted photo collections, but Eastman Kodak's Shoebox is a far more efficient storage mechanism than its real-world namesake. Shoebox provides a one-stop catalog of your visual media, letting you sort, search, retrieve, copy, and print as many as 30,000 images per catalog. Each cataloged image is represented by a thumbnail image and data values you enter.

Photo CD Favored. As you might suspect, Shoebox is optimized for images in the Kodak Photo CD format. You can retrieve a Photo CD image in any of the five available resolutions and view it in various color depths, including gray-scale and 24-bit color. Shoebox supports other file types, including EPS, PICT, TIFF, QuickTime, and AIFF sound files, but the support is only minimal. For example, CMYK TIFF files invariably become garbled images.

Custom Descriptor Fields. Shoebox shines in its handling of data entry. In addition to providing fields for keywords and captions, the program lets you define as many as 100 additional data fields. To make data entry easier and more accurate, you can use the Entry Helper to create pop-up lists of often-used values. During data entry, you can select multiple thumbnails and then simultaneously enter shared data values for them — a real time-saver. Shoebox also lets you customize several aspects of the layout, such as thumbnail size, but there's no Undo command for restoring default settings.

Find Images Easily. Using a Shoebox catalog is relatively straightforward. You scroll through images in the catalog window — albeit slowly (we wish there were a list view) — and reorder thumbnails simply by dragging them to new positions. Double-clicking on a thumbnail retrieves the image; simultaneously holding down the Option key launches the creator application. Shoebox's multilevel search routine lets you find images based on a variety of criteria. You can also mark thumbnails and view them in isolation or save them as a separate minicatalog.

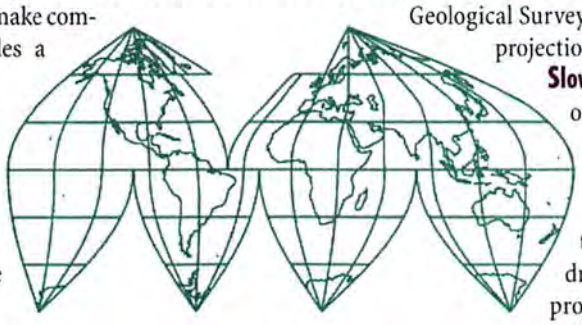
Frustrating Features. Unfortunately, Shoebox's innovations are offset by some poorly implemented features — for example, although you can rearrange user-defined fields in the setup dialog box, they always appear alphabetically in each image's Info Sheet. The terminology is often arcane (Parse Subfolders) or unexplained (Global Index). And, although the manual says Shoebox requires 3 megabytes of RAM, it actually requires at least 5 megabytes; it adds an unadvertised 2 megabytes to your system software's allocation.

If you deal mainly with Photo CD images or need lots of user-definable fields, Shoebox may be a good fit. Otherwise, you're better off with a program such as Aldus Fetch that's easier to use and supports more file types. / Aileen Abernathy

Shoebox ★★★ / COMPANY: Eastman Kodak, Rochester, NY; 800-242-2424 or 716-724-4000. VERSION: 1.0. LIST PRICE: $245. READER SERVICE: circle #431.

Geocart / Professional map projections

GEOCART ADDRESSES THE AGE-OLD problem of representing the spherical globe of Earth on a flat piece of paper. Some maps distort direction, some distort size, and most distort both direction *and* size in projecting spherical reality onto a planar surface. There's no perfect way to do this task, so you must make compromises. Fortunately, Geocart provides a dazzling array of projection choices — cylindrical, conic, and azimuthal are just three of its major options, with many minor variations possible — along with its wealth of data for map-making, so you can make just those compromises best suited to the purpose of any map you make.



Built-in Global Database. Once you've chosen an appropriate projection, you decide what to show on the map. Geocart provides the data you need to map anyplace on Earth at the macro level, where projection is an issue; that is, you can choose to show regular latitude and longitude lines; coast lines; hydrography (rivers and lakes); major city locations; and national, provincial, and county borders. You can include or exclude any of these data elements as well as configure line weight, color, and pattern. When you draw your own lines on a map to show routes or flight paths, Geocart makes them fit the appropriate projection. For further customization, you can change the projection by choosing the center point of the projection or specifying a rotation of the globe (which is called an aspect) before projection. This process may sound difficult, but Geocart makes it quite easy and logical.

The program includes a hefty 170-page manual that's chock-full of useful explanations, as well as two marvelous books from the U.S. Geological Survey that teach you all about maps and projections.

Slow Printing. One of the few drawbacks of this program is that it takes forever to print and doesn't provide a progress bar during printing. Geocart produces beautiful maps, though, so it's worth the wait (screen drawing, fortunately, is a background process). Another drawback is Geocart's lack of drawing or text tools. To enhance your maps with fills, labels, or other graphics, you have to use a program such as Adobe Illustrator (Geocart exports to bit-map, PICT, and Illustrator formats).

If you want to throw away those many megabytes of old clip-art maps and substitute a single program that produces superior and beautiful maps exactly tailored to your needs, rush out and get Geocart. / Ron Hipschman

Geocart ★★★★ / COMPANY: Terra Data, Inc., Croton-on-Hudson, NY; 212-675-2971. VERSION: 1.3.1. LIST PRICE: $499 (educational, $449); additional-machine license, $100. READER SERVICE: circle #432.

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Wiz Tools / Been there, done that

THE SYSTEM 7-ENHANCEMENTS FIELD is already crowded with useful as well as bogus utilities, so any new contender had better provide some noteworthy new abilities. Unfortunately, this just isn't the case with Wiz Tools, from ASD Software. You've seen it all before . . . and you've seen it done better.

Familiar Features. We couldn't help playing the mental game of "what's *this* a version of?" while looking over the Wiz Tools modules: ColorSwitcher lets you switch color depths on your monitor just as you can with the shareware Switcheroo (not to mention Now Utilities and CE Software's QuicKeys); FinderTools is a Finder-operations speeder-upper that's partly like NowMenus and partly like the shareware products System 7 Pack and Speedy 7; Keystroke Recorder is similar to Working Software's Last Resort and Thunder 7's Ghostwriter; Launcher is an application-launch helper that's no different than any of 20 shareware launching utilities, not to mention QuicKeys; SubMenu is another NowMenus clone for adding submenus onto menus; Twins provides anemic backup and synchronization capabilities; and PowerBook Utilities is dwarfed by the heavy competition in the also overcrowded PowerBook subgenre of this field.

Two Standout Modules. Wiz Tools does include a couple of decent modules. WatchFolder watches over any folder and alerts you if it's modified. It can also work effectively with FileShare or AppleShare to inform a system administrator about who's doing what to whom on a network. WorldClock not only displays the time and/or date in the menu bar but also lets you create and display clocks for different locales and time zones.

Clean and Easy. Wiz Tools offers a clean-cut interface and easy installation. The Wiz Tools control panel is all that's installed in the Control Panels folder; its modules live in a separate folder outside. The configuration panels for each module are almost sinfully easy to figure out (Now Software could certainly take a lesson from ASD Software on this point), and the documentation is attractively straightforward.

Ultimately Unsatisfying. So why isn't this product better? Because, even taken at face value with no comparisons to other products, each module leaves the user wanting more: Launcher has no way of reminding you of key shortcuts, WorldClock doesn't support other chime sounds, Twins' backup scheme doesn't support floppy-disk sets and is painfully slow, Keystroke Recorder dumps a day's work into one text file instead of breaking down the input by application and document in Finder format — and so on.

If you want a fairly low-RAM way to get the basic capabilities mentioned here (Wiz Tools takes up 1,200 to 1,500K of RAM, compared to 1,800 to 2,200K for the more capable QuicKeys or NowMenus), you'll probably find Wiz Tools to be an adequate choice. For more-demanding Mac users, however, Wiz Tools is eminently forgettable. / Ken Gruberman

Wiz Tools ★★½ / **COMPANY: ASD Software, Montclair, CA; 909-624-2594. VERSION: 1.1. LIST PRICE: $129. READER SERVICE: circle #433.**

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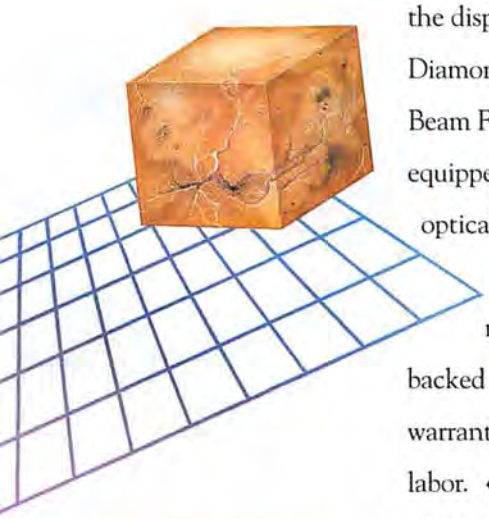
Explore a brilliant new world of increased display clarity with Mitsubishi's third generation of flat square color monitors, including the Diamond Scan 15FS, Diamond Scan 17FS and Diamond Pro® 21FS. The Mitsubishi 15", 17" and 21" flat square line reduces image distortion and screen glare while delivering high-end performance, quality and features – all at exceptionally competitive pricing. ♦ Each of the models features an ultra-fine 0.28 mm dot pitch suitable for all high resolution applications; an Invar mask for sustained high brightness levels; an ergonomically-designed, compact enclosure with a tilt-swivel base; and the easy-to-operate, microprocessor-based front panel user controls allow you to fine tune the display to your color board. To provide the highest levels of display accuracy, the Diamond Scan 17FS and top-of-the-line Diamond Pro 21FS incorporate Dynamic Beam Forming, which reduces image distortion found at the edges of any monitor not equipped with this feature. ♦ Both units also feature Mitsubishi's exclusive new optical quality anti-static and anti-reflective coating on a high contrast tinted CRT.



What's more, all three monitors meet strict international guidelines for low magnetic emissions and are fully backed with a three-year warranty on parts and labor. ♦ No matter which Mac® you're using, simply select the appropriate cable adapter from your dealer.* See our latest — *and greatest* – generation of flat square monitors for yourself. And gain a new perspective on quality, durability and value. ♦ For more information, call us at 1-800-843-2515. In Canada, call 1-800-387-9630 or in Mexico 91-800-83456. *For immediate information call Mitsubishi Qwikfax at (800) 937-2094.*

DS15FS: $645 MSRP
DS17FS: $1,299 MSRP
DP21FS: $2,999 MSRP

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Mitsubishi Electronics America, Inc., Display Products, 5665 Plaza Drive, Cypress, CA 90630
Mitsubishi Electric Sales Canada, Inc., 4299 14th Avenue, Markham, Ontario L3R 0J2

*Free signal cable adapters available for the Macintosh® LC, Centris, II, and Quadra families.
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Manufacturer's Suggested Retail Price (MSRP) subject to change. © 1993 Mitsubishi Electronics America, Inc.

In Search of the SAFEST Monitor

Eyestrain, backaches, wrist injuries, radiation scares — is your Mac out to get you? **By Winn L. Rosch**

PHOTOGRAPHY / RICK ENGLISH

Picking a good-looking midsized color monitor has gotten a lot more pleasant than it used to be. Display image quality continues to improve. Differences these days are often in the eye of the beholders, and those beholders are demanding new things from manufacturers: features that protect them from eyestrain and electromagnetic emissions.

EMISSIONS

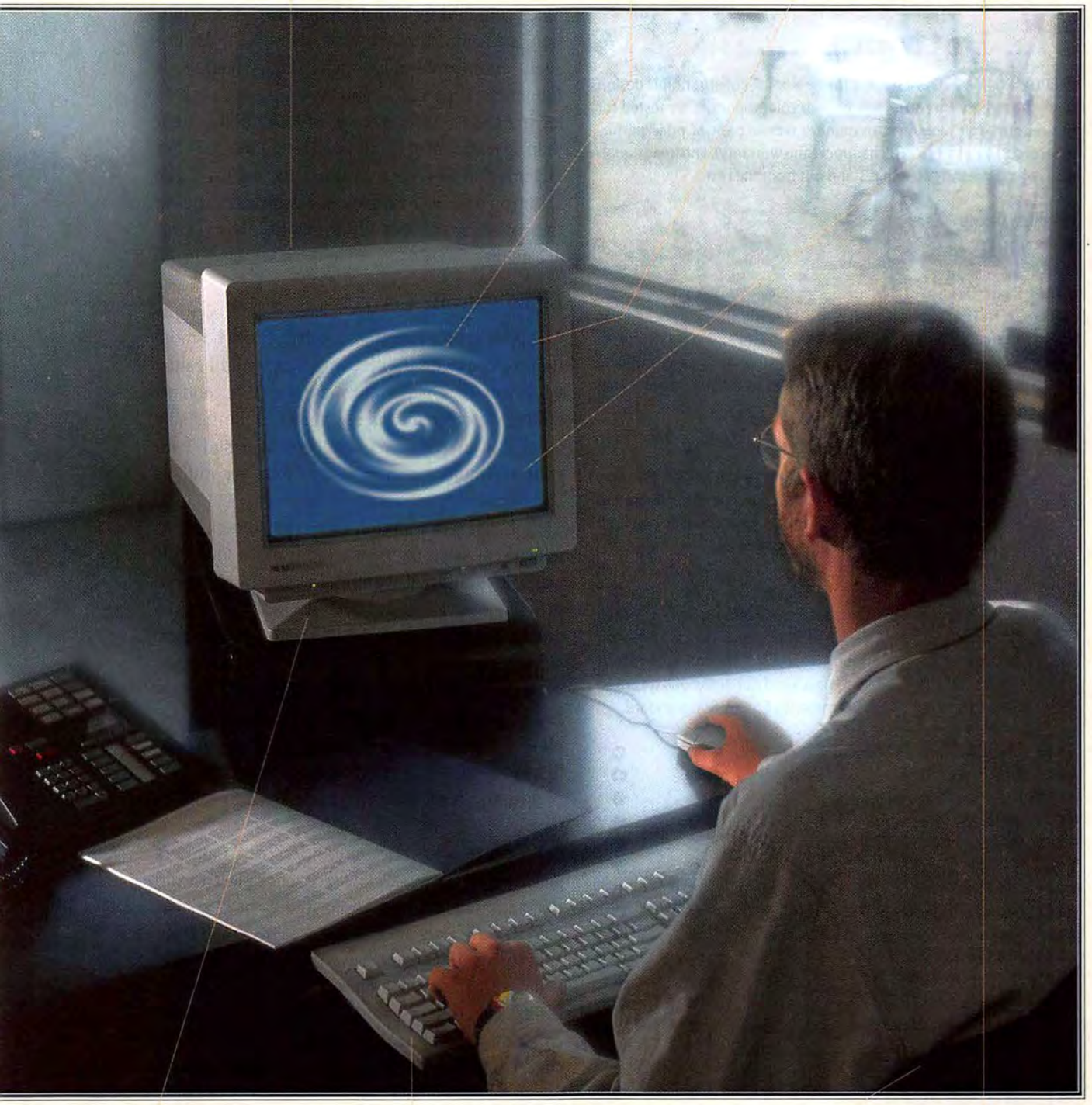
RATING: Does the monitor comply with current standards?

IMAGE QUALITY

SHARPNESS: Is the image crisp?

SCREEN: Is there antiglare coating?

BRIGHTNESS: Is the image easy to see?



ERGONOMICS

EYE LEVEL: Is the monitor base adjustable?

KEYBOARD: Is the stand adjustable?

WORK AREA: Are the seat and keyboard positions adjustable?

LIGHTING: Where is the natural light source?

To help you choose the best of a good crop, we took a look at twenty-three 16- and 17-inch color monitors. Although prices vary widely ($850 to $1,775 street), you'll find more on-screen similarities than differences among these products. Most of them offer similar features, and their image quality appears closely matched. In terms of overall image quality, three monitors stood out: the RasterOps Sweet 16, the Sony CPD-1730, and the SuperMac SuperMatch 17T (see figure 1).

One reason for the closeness in quality is that the Mac's standard for a 16-inch monitor — a resolution of 832 x 624 pixels, which delivers 72-dpi images — is no problem for modern autosynchronous monitors. Often called autosyncs, these monitors let you choose from a range of resolutions rather than operating at only one fixed resolution. Another factor is that monitor technology has matured. The Trinitron and Invar shadow-mask picture tubes in these monitors provide almost uniformly good image quality.

The Bottom Line

IMPROVING IMAGE QUALITY and the beginnings of ergonomic design mark the twenty-three 16- and 17-inch color monitors we tested for this report. After judging each monitor on the basis of price/performance, customer service (tech support and warranty), and image quality, we recommend three that stand out from the rest.

⊕ = OUTSTANDING
● = ACCEPTABLE
⊖ = POOR

	PRICE/ PERFORMANCE	CUSTOMER SERVICE	IMAGE QUALITY
★★★★½ RasterOps Sweet 16	●	⊕	⊕
★★★★ Sony CPD-1730	●	●	⊕
★★★½ Nanao FlexScan T560i	⊖	●	⊕
★★★★ Apple Macintosh 16" Color Display	⊕	●	⊕
★★★★ E-Machines T-16 II	●	●	⊕
★★★★ Mirror 16" Trinitron	⊕	●	●
★★★★ Mitsubishi Diamond Pro 17	●	●	●
★★★★ Mitsubishi Diamond Scan 16	●	●	●
★★★★ NEC MultiSync 5FG	⊖	●	●
★★★★ NEC MultiSync 5FGe	●	●	●
★★★★ SuperMac SuperMatch 17T	●	●	⊕
★★★★ Tatung CM-17MBD	●	●	●
★★★½ CTX 1760LR	●	⊖	●
★★★½ Mag InnoVision MX17S	●	●	●
★★★½ Nanao FlexScan F550i•w	⊖	●	●
★★★½ Radius PrecisionColor Pivot	●	●	●
★★★½ Sampo AlphaScan 17	●	⊖	●
★★★½ Sceptre CL-617	⊕	⊖	●
★★★½ Sigma Ergoview 17	●	●	●
★★★½ Sony CPD-1604S 17"	●	●	●
★★★½ ViewSonic 17	●	●	●
★★★ Sampo AlphaScan 17e	●	⊖	●
★★★ Samsung SyncMaster 5c	●	●	⊖

Listing is alphabetical within groups of equal mouse ratings.

The best image quality of all the monitors we tested was that of the RasterOps Sweet 16 ($1,499 list, $1,175 street). RasterOps' tech support and the monitor's plug-and-play convenience for Macintosh users make the Sweet 16 an excellent choice.

Superb performance in our image-quality tests makes the Sony CPD-1730 ($1,330 list, $1,125 street) an all-around standout. Its multifrequency capability makes it an excellent choice for cross-platform environments.

If environmental considerations play a major role in your decisions, the Nanao FlexScan T560i ($2,199 list, $1,775 street) is the monitor for you. Although expensive, it was the only product to pass all of our emissions tests and the only one to meet the U.S. government's Energy Star standard.

Ergonomically Correct

The beauty of a monitor, however, must be more than screen-deep. To keep you happy and healthy while you work, a monitor must also have good ergonomics, which means you must feel comfortable using it. By matching our image-quality results with your ergonomic requirements, you can quickly come up with a personal winner.

If choosing a monitor based on something as ephemeral as ergonomics sounds like a big headache, be aware that using the wrong monitor can give you migraines and even worse. According to one estimate, as many as 10 million people may suffer from an ailment known as CVS (computer vision syndrome), which is characterized by an array of symptoms, including eyestrain, fatigue, blurred vision, double vision, and headaches. Poor display quality can potentially aggravate otherwise unnoticed vision problems to produce full-blown CVS.

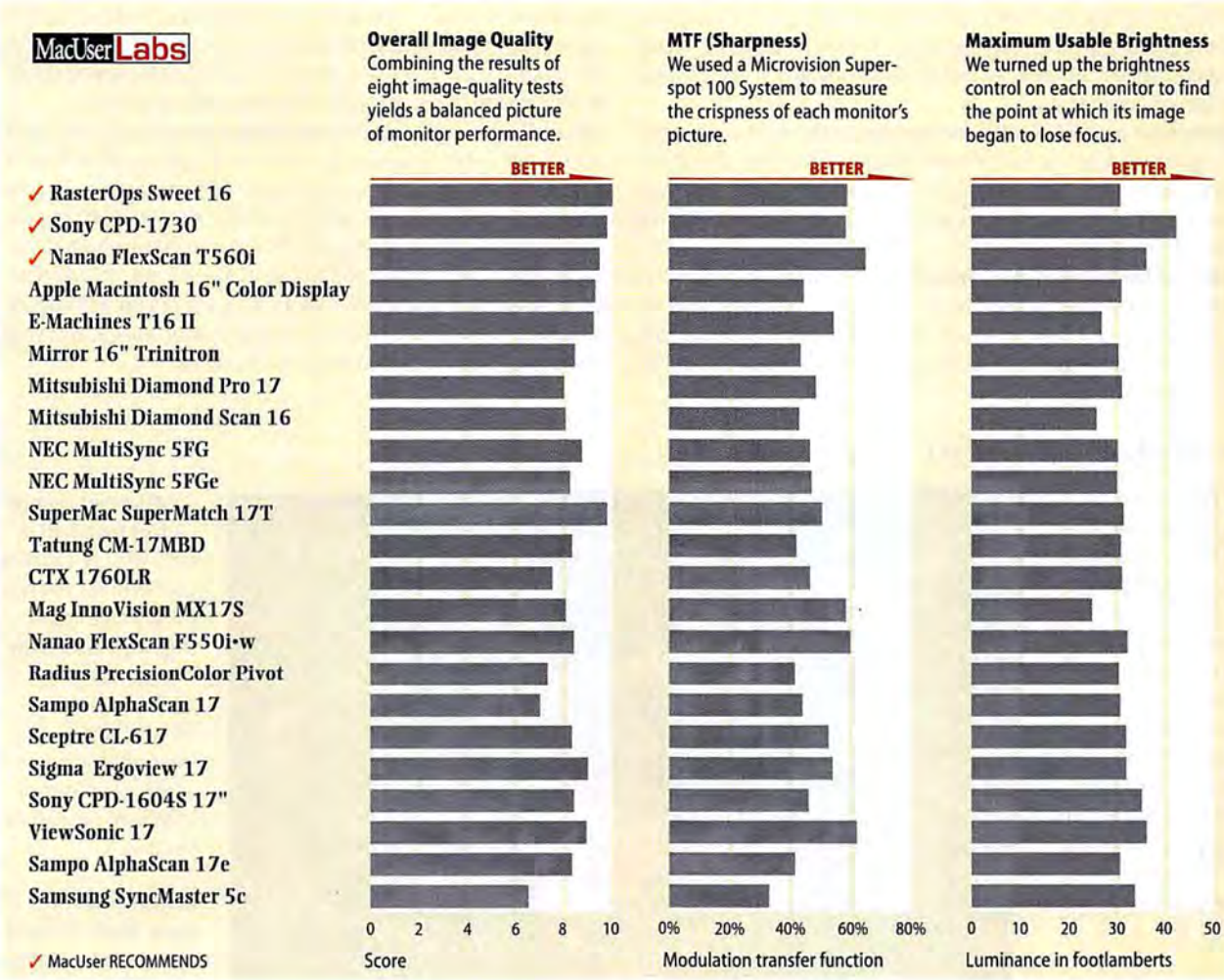
What's worse, some poorly designed monitors generate high levels of low-frequency electric and magnetic fields, which some studies have associated with miscarriages and cancer. Although there is at this time no conclusive proof that emissions from computers or monitors cause any adverse health effects, several standards for measuring emissions have been created in response to the concerns of individuals and interest groups about worker safety (see the "Monitor Emissions" sidebar).

We tested each monitor for compliance with two standards developed in Sweden (MPR II and TCO) by measuring the level of VLF (very low frequency) and ELF (extremely low frequency) emissions the

figure 1

Pretty Pictures / an objective look at monitor performance

We combined the results of four sharpness and focus tests (MTF, pincushion, misconvergence, and time variance) with those of four color-analysis tests (brightness, color tracking, color range, and spatial uniformity) to arrive at a rating of each monitor's overall image quality on a scale of 0 to 10. We've also provided the individual results of two tests of particular importance to users: MTF and brightness.



monitor generated. We placed each monitor in a Faraday cage, which isolated it from external magnetic fields, and took measurements at numerous angles and at varying distances, as prescribed by the MPR II and TCO standards. We found that most monitors were fully or partially compliant with MPR II, but only one — the Nanao FlexScan T560i — met the tougher TCO standard.

Our mouse ratings do not reflect the results of our emissions tests, because the effect of low-frequency radiation has not yet been proved dangerous. If you feel that a low level of emissions is desirable, choose the Nanao FlexScan T560i, which meets the MPR II and TCO standards and which scored well on our image-quality tests.

Energy Stars

Conserving energy was all the rage in the post-oil-embargo days of the mid-1970s but seemed to lose its cachet as the energy crisis abated. Now the Clinton administration's Energy Star program requires that monitors sold to the government consume less than 30 watts of power in energy-saving mode. Because it's a government requirement, the Energy Star standard will soon become an industry standard. Of the monitors we tested, all available before the Energy Star program was announced, only the two Nanao monitors were compliant and only when using Power Save, a screen saver that shuts down the monitor when it's idle. Without Power Save, the Nanao monitors consumed well more than 100 watts each.

Ergonomics and Lighting / strategies for a healthy workplace

WORKING WITH COMPUTERS is no substitute for regular physical exercise, but repetitive tasks performed at a Mac or other computer may give your body and eyes a workout. CVS (computer vision syndrome), carpal-tunnel syndrome, back pain, and several other ailments are common complaints among computer-using, keyboard-punching, mouse-clicking, monitor-gazing workers. The good news is that many of these maladies can be alleviated by simple changes in your physical or lighting environment.

Concern for people's health and comfort has brought a wide array of ergonomic furniture to the modern office. Adjustable chairs with lumbar supports; desks and tables with keyboard racks; and even mouse pads, braces, and monitor stands can be used to customize the work space.

Although the physical environment can be customized with devices and adjustments, the lighting environment, crucial to the prevention of vision-related health problems, requires a more comprehensive approach. Easing eyestrain caused by computer use frequently involves redirecting the ambient light in your office away from the monitor and onto paper-based work. Monitor makers help by affixing antiglare coatings to their products' screens. You can also purchase panels that fit over the screen, but these are less effective, because they often blur the image or reduce apparent screen brightness. Another built-in ergonomic feature of most midsized monitors (all of those we tested for this article) is a swivel base, which lets you adjust the screen's angle depending on your needs and the lighting within your office.

You can improve your ergonomic environment by adopting good work habits and pacing yourself. Sit in a comfortable position 18 to 24 inches from the monitor screen. This is the best arrangement for your eyes and also mitigates VLF- and ELF-emission dangers. Don't rest the heel of your hand on the keyboard or "dive" onto the keys from above. Let your arms hang loosely, and type so that your hands approach the keys straight from your elbow. Look away from your work periodically, preferably out of a window or at an image in your office to rest your eyes and give them some variety. / Paul LaBerge

5 Steps to Better Ergonomics

1 / Adjustable backrest. Depending on the kind of work you do, you may want to tilt your chair's backrest slightly forward or backward. If you do lots of typing, tilt it backward 5 to 10 degrees. If you spend more time working with graphics, layouts, or photos on-screen, try tilting the backrest slightly forward.

2 / Adjustable seat height and tilt. Adjust the chair so your feet rest on the floor with the seat tilted slightly forward. This provides support for your body without restricting the blood supply to your legs. Raising your feet slightly with a low footrest can also improve circulation in your legs.

3 / Two-level desk for keyboard and monitor. Use an adjustable desk or keyboard rack. Locate the keyboard so that your arms hang loose as you type, with elbows level with the "home row" on the keyboard. Position the monitor so that your eyes are level with the top of the screen, about 18 to 24 inches away. This will conform to the natural angle of sight — looking as much as 10 degrees downward.

4 / Wrist rest, mouse pad, or trackball. A foam wrist rest supports your wrists as you type. Using a mouse pad angled up toward the back can achieve a similar result. If you find that using a standard Mac mouse is uncomfortable, try a contoured variety or a trackball.

5 / Task light for paperwork. Ambient light levels for computer work should be somewhat lower than for paper-based tasks. Reduce overall luminance, and add an adjustable task light focused on your paperwork but away from the screen so that glare doesn't wash out your screen. Place text material on a copyholder, located in the same plane as your monitor's screen.

ILLUSTRATION / LIN WILSON

4 Steps to Better Lighting

1/ Monitor position relative to windows. Place your monitor so that the screen is perpendicular to windows or bright surfaces. This keeps glare-creating light sources out of the field of view and prevents screen reflections. Arrange your office so that you are neither facing a window nor sitting with your back to one. Facing a window forces you to cope with excessive contrast between the monitor and the window; sitting with your back to a window produces bright reflections on-screen.

2 / Ambient lighting patterns designed for computer use. General lighting should provide a uniform low level of illumination throughout the office space and on surfaces. Task lights should provide higher light levels where needed. Light should be focused in a way that does not cause screen reflection.

3 / Furniture and material finishes. Nonreflective finishes on furniture and partitions prevent glare from lights and windows that might cause bright spots on the display. The light from suspended indirect-light fixtures should blend with the brightness of the ceiling. Too much contrast will cause reflections on-screen.

4 / Contrast of foreground and background. Partitions and objects placed near the computer should be similar in brightness to the display. Surfaces that are farther away and that account for a smaller portion of what you see should be substantially less bright.

3 Lighting Mistakes to Avoid

1 / Screen glare is caused by bright lights, bright surfaces, or uneven light distribution behind you; all of which reflect off the screen. Blocking excess brightness is one way to deal with reflections. Monitor brightness also affects screen reflections: Turn the brightness up to decrease the effect. If you can't adjust the position of the monitor or block reflections, install a mesh screen or a polarizing filter.

2 / Windows or bright lights in front of your computer can cause eyestrain by forcing your eyes to adapt to very bright and very dark objects. Windows and bright lights behind you cause harsh reflections on-screen that wash out the image. Turn the monitor so that it is perpendicular to windows and bright light sources. When moving the monitor is impossible, block the reflected light with baffles or partitions.

3 / Our eyes' ability to adapt to a given level of brightness depends on the contrast and on the angle of the surface. A large area of moderate brightness can be just as annoying as a small but very bright surface. A bright surface perpendicular to your line of sight is not as uncomfortable as a bright surface adjacent to it. Reduce contrast by using light-colored matte-finished materials, furniture, and equipment.

Image and Vision

One of the best ways of reducing your risk of developing CVS is to choose a monitor that produces clear, crisp, and colorful images. It just so happens that these are the criteria that we — and most monitor buyers — have always used to judge a display's quality.

According to research conducted by the VDT Eye Clinic at the University of California, Berkeley, one of the most important factors in improving your visual relationship with a monitor — and hence, your chances of avoiding CVS — is contrast. Greater contrast between an image and the background makes it easier for your eyes to distinguish lines and letters. Contrast can be enhanced by characteristics such as sharpness and brightness as well as factors other than image quality, such as the color of the text (the Macintosh's black letters on a white background are preferable) and glare from lights and windows (see the "Ergonomics and Lighting" sidebar).

Several factors contribute to the sharpness of a display: the monitor's dot pitch (the distance between the center of one dot and the center of the next), the bandwidth (the frequency with which the image is drawn on-screen) of its electronics, and the proper setup of the monitor itself. In theory, a low dot pitch and a high bandwidth should give a display an edge in sharpness.

Monitor Emissions / big deal?

RADIATION. The word sends chills through some people and stirs up controversy among most of us. Everyone seems to have an opinion about hazardous emissions from everything from nuclear power plants to the computers on our desks. A potent source of contention is the CRT (cathode-ray tube) present in all conventional monitors. CRTs generate radiation that escapes from the monitor and that may threaten your health.

Monitors have two classes of emissions: ionizing and nonionizing radiation. Ionizing radiation — X rays and ultraviolet rays — are known health hazards and proven carcinogens. In the U.S., monitor (and TV) emissions of these forms of radiation are regulated by tough FCC rules, making them a nonissue for CRT users. Nonionizing radiation occurs at much lower frequencies. Except for FCC certification, which designates products as either Class A (restricted to industrial use) or Class B (suitable for home use), no U.S. laws govern these emissions, called VLF (very low frequency) and ELF (extremely low frequency) emissions.

Three measurement standards form the basis for evaluating equipment, including computer monitors, for excess emissions. Two were promoted by the Swedish Board for Measurement and Testing (usually abbreviated MPR, its initials in Swedish). These standards are called MPR and MPR II, the latter superseding the former in 1990.

The original MPR standard focused solely on alternating magnetic fields with frequencies from 1 to 400 kilohertz, which include the horizontal-scanning frequencies of monitors in the VLF range. MPR II

We evaluated sharpness by measuring the MTF (modulation transfer function) of each of the monitors with a Microvision Superspot 100 System. MTF is essentially a measure of the contrast

Apple Macintosh 16" Color Display
RATING: ★★★★
LIST PRICE: $1,459.
STREET PRICE: $1,150.
PROS: Convenient ports (ADB, headphone, speaker). Good spatial uniformity.
CONS: Single-resolution display. Controls difficult to use. Display slightly jittery.
DISPLAY TECHNOLOGY: Trinitron.
ACTIVE-SCREEN SIZE (DIAG.): 14.75 in.
MAX. RESOLUTION: 832 x 624 pixels.
VIDEO BANDWIDTH: 60 MHz.
VERTICAL-SCAN RATE: 75 Hz.
HORIZONTAL-SCAN RATE: 50 kHz.
POWER CONSUMPTION: 130 watts.
COMPANY: Apple Computer, Inc., Cupertino, CA; 800-776-2333 or 408-996-1010.

CTX 1760LR
RATING: ★★★½
LIST PRICE: $1,499.
STREET PRICE: $850.
PROS: Inexpensive.
CONS: Poor tech support. Mac 16"-display adapter not available from vendor. No antiglare treatment.
DISPLAY TECHNOLOGY: Shadow mask.
ACTIVE-SCREEN SIZE (DIAG.): 15.375 in.
MAX. RESOLUTION: 1,280 x 1,024 pixels.
VIDEO BANDWIDTH: 100 MHz.
VERTICAL-SCAN RATE: 50 – 90 Hz.
HORIZONTAL-SCAN RATE: 30 – 65 kHz.
POWER CONSUMPTION: 100 watts.
COMPANY: CTX International, Inc., Walnut, CA; 800-888-2012 or 909-598-8094.

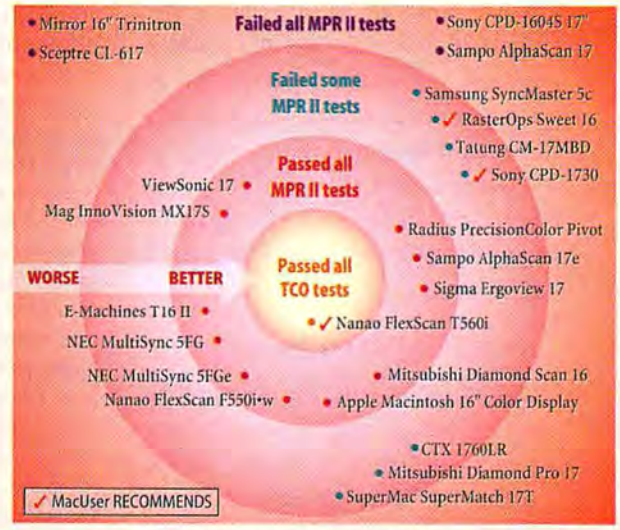
E-Machines T16 II
RATING: ★★★★
LIST PRICE: $1,399.
STREET PRICE: $1,200.
PROS: Good color accuracy.
CONS: Not FCC Class B-certified.
DISPLAY TECHNOLOGY: Trinitron.
ACTIVE-SCREEN SIZE (DIAG.): 16 in.
MAX. RESOLUTION: 1,280 x 1,024 pixels.
VIDEO BANDWIDTH: 110 MHz.
VERTICAL-SCAN RATE: 50 – 120 Hz.
HORIZONTAL-SCAN RATE: 30 – 68 kHz.
POWER CONSUMPTION: 130 watts.
COMPANY: E-Machines, Sunnyvale, CA; 800-344-7274 or 408-541-6100.

extended the standard to electric and magnetic fields and lowered its reach to 5 hertz. MPR II thus also includes vertical frequencies in the ELF band.

A third Swedish standard — developed by TCO, the Swedish office-workers' union — is becoming more prominent. The TCO standard includes many of the same elements as MPR II but sets more-stringent limits on levels for low-frequency fields. For example, it requires measurements to be made closer to monitors — at 30 centimeters (11.81 inches) instead of MPR II's 50 centimeters (19.685 inches) — where fields are stronger. Separate TCO guidelines specify standards for energy conservation similar to those of the Energy Star program promoted by the Clinton administration.

The relationship between ELF and VLF emissions and human health remains clouded by conflicting studies. Some were conducted by interested parties, such as the Electrical Power Research Institute, whose narrow methodology led to the conclusion that emissions posed no risk. Other studies cite increased incidence of miscarriage among women exposed to radiation but do not prove a cause-and-effect relationship, because other variables were not eliminated.

Most monitors (including all but four of those we evaluated for this report) meet some of MPR II's requirements; the Nanao T560i alone meets the much stricter TCO guidelines. But Nanao's low emissions come at a high price: An expensive antireflective panel inside all T-series Nanao monitors prevents most emissions from escaping the monitor's front panel. / Winn L. Rosch



Monitor emissions radiate mainly from the back and sides of the box. MPR II and TCO testing measures the amount of ELF and VLF emissions that also escape through the front of the screen. Most of the monitors we tested passed some or all of the MPR II test suite, whereas only one passed the stricter TCO tests. Monitors that passed only some of the tests are not MPR II-compliant.

between closely spaced light and dark lines. The higher the contrast, or the MTF value, the sharper the display appears. Surprisingly, our measurements showed hardly any correlation between a monitor's dot pitch and bandwidth and the display's sharpness. Although the two monitors that had the highest MTF values (the Nanao FlexScan T560i and the ViewSonic 17) each had a dot pitch of .25

Mag InnoVision MX17S

RATING: ★★★½
LIST PRICE: $1,599.
STREET PRICE: $1,400.
PROS: Good color accuracy.
CONS: No antiglare treatment. Not FCC Class B-certified.
DISPLAY TECHNOLOGY: Shadow mask.
ACTIVE-SCREEN SIZE (DIAG.): 16.25 in.
MAX. RESOLUTION: 1,280 x 1,024 pixels.
VIDEO BANDWIDTH: 120 MHz.
VERTICAL-SCAN RATE: 50 – 120 Hz.
HORIZONTAL-SCAN RATE: 30 – 68 kHz.
POWER CONSUMPTION: 130 watts.
COMPANY: Mag InnoVision, Santa Ana, CA; 800-827-3998 or 714-751-2008.

Mirror 16" Trinitron

RATING: ★★★★
LIST PRICE: $1,099 (direct).
PROS: Money-back guarantee.
CONS: Poor geometry. Awkward controls. No antiglare treatment.
DISPLAY TECHNOLOGY: Trinitron.
ACTIVE-SCREEN SIZE (DIAG.): 15.25 in.
MAX. RESOLUTION: 832 x 624 pixels.
VIDEO BANDWIDTH: 60 MHz.
VERTICAL-SCAN RATE: 50 – 87 Hz.
HORIZONTAL-SCAN RATE: 28 – 57 kHz.
POWER CONSUMPTION: 120 watts.
COMPANY: Mirror Technologies, St. Paul, MN; 800-654-5294 or 612-633-4450; 612-633-3136 (fax).

Mitsubishi Diamond Pro 17

RATING: ★★★★
LIST PRICE: $1,499.
STREET PRICE: $1,175.
PROS: 3-year warranty.
CONS: Display slightly jittery.
DISPLAY TECHNOLOGY: Trinitron.
ACTIVE-SCREEN SIZE (DIAG.): 15.95 in.
MAX. RESOLUTION: 1,280 x 1,024 pixels.
VIDEO BANDWIDTH: 100 MHz.
VERTICAL-SCAN RATE: 50 – 130 Hz.
HORIZONTAL-SCAN RATE: 30 – 64 kHz.
POWER CONSUMPTION: 130 watts.
COMPANY: Mitsubishi Display Products, Cypress, CA; 800-843-2515 or 714-220-2500; 714-236-6187 (fax).

millimeters and a bandwidth of 130 megahertz or more, the third-place Nanao FlexScan F550i•w had a ho-hum .28-millimeter dot pitch and a modest 80-megahertz bandwidth. In other words, if you want to please your eye, take a look at the test results.

Overall, all of the monitors in our tests, with the exception of the Samsung SyncMaster 5c, exhibited good sharpness.

Harmonic Convergence

Convergence — the measure of how well a monitor brings all three primary colors together at every pixel on the screen — also affects on-screen sharpness. In general, monitors with poor convergence have displays that appear fuzzy near the corners, because the spread of the three electron beams that produce the colors blurs each pixel.

Convergence wasn't a problem with the majority of the monitors we tested. All but six of them were able to keep beams that produce red, green, and blue focused within the diameter of a single pixel (.014 inch at 72 dpi) across the screen. Only one of the monitors, the Sceptre CL-617, exhibited notably poor convergence, which measured .021 inch in the worst case we discovered.

Glare reduces contrast and can aggravate CVS. Most monitors' screens are treated to reduce glare. However, some antiglare treatments — etched screens and mesh filters — result in a sacrifice in display sharpness for increased contrast. Coatings

Trends / building a better monitor

COLOR MONITORS JUST KEEP GETTING BETTER AND BETTER. In fact, image quality is better than ever, across the board, forcing vendors to find new ways to differentiate themselves from competitors when all manufacturers are using one of only two basic types of picture tube. Several trends in monitor manufacturing will also ease the minds of environmentally conscious folks.

On-screen control menus are coming to the desktop. To cope with an increasingly diverse array of computers, monitors are sporting a growing number of controls. Providing a knob or dial for each has become unmanageable, and combining functions is confusing. Finnish monitor maker Nokia has developed a programming system that provides on-screen menus — legible at all resolutions — for controlling all monitor functions, from color temperature to pincushion distortion. Expect other monitor makers to follow suit.

Power consumption is important. As the federal government's Energy Star program takes hold, most monitor vendors will be adding power-saving features to their products. NEC, Nokia, and Sony have already joined Nanao in providing power-management software (usually a screen saver), which shuts down the CRT when it's not in use.

Emissions worry consumers. Despite a lack of conclusive proof that high ELF and VLF emissions cause miscarriages, cancer, or other adverse health effects, several vendors are building monitors that meet the tough TCO standard. Most monitors currently comply with the older MPR II standard. / Shelly Brisbin

Mitsubishi Diamond Scan 16
RATING: ★★★★
LIST PRICE: $1,169.
STREET PRICE: $875.
PROS: Inexpensive. Low emissions. 3-year warranty.
DISPLAY TECHNOLOGY: Shadow mask.
ACTIVE-SCREEN SIZE (DIAG.): 15.125 in.
MAX. RESOLUTION: 1,024 x 768 pixels.
VIDEO BANDWIDTH: 100 MHz.
VERTICAL-SCAN RATE: 50 – 130 Hz.
HORIZONTAL-SCAN RATE: 30 – 64 kHz.
POWER CONSUMPTION: 130 watts.
COMPANY: Mitsubishi Display Products, Cypress, CA; 800-843-2515 or 714-220-2500; 714-236-6187 (fax).

Nanao FlexScan F550i•w
RATING: ★★★½
LIST PRICE: $1,599.
STREET PRICE: $1,150.
PROS: Energy Star-compliant. Excellent controls.
CONS: Poor spatial uniformity.
DISPLAY TECHNOLOGY: Shadow mask.
ACTIVE-SCREEN SIZE (DIAG.): 15.75 in.
MAX. RESOLUTION: 1,280 x 1,024 pixels.
VIDEO BANDWIDTH: 80 MHz.
VERTICAL-SCAN RATE: 55 – 90 Hz.
HORIZONTAL-SCAN RATE: 27 – 65 kHz.
POWER CONSUMPTION: 120 watts.
COMPANY: Nanao USA Corp., Torrance, CA; 800-800-5202 or 310-325-5202.

Nanao FlexScan T560i
RATING: ★★★½
LIST PRICE: $2,199.
STREET PRICE: $1,775.
PROS: Very low emissions. Energy Star-compliant. Very sharp image quality. Excellent controls.
CONS: Very expensive. Poor color accuracy.
DISPLAY TECHNOLOGY: Trinitron.
ACTIVE-SCREEN SIZE (DIAG.): 16 in.
MAX. RESOLUTION: 1,280 x 1,024 pixels.
VIDEO BANDWIDTH: 130 MHz.
VERTICAL-SCAN RATE: 55 – 90 Hz.
HORIZONTAL-SCAN RATE: 30 – 82 kHz.
POWER CONSUMPTION: 140 watts.
COMPANY: Nanao USA Corp., Torrance, CA; 800-800-5202 or 310-325-5202.

and darkened glass generally preserve sharpness. The NEC MultiSync 5FG and 5FGe monitors each rely on an optional $119 glare-reducing lens.

When a straight line doesn't look straight on your monitor, the display is said to suffer from pincushioning. With the Microvision Superspot 100, we followed one end of a white line across the monitor, measuring the amount of variance from perfect straightness, or the amount of pincushion error.

We measured the pincushion error at three horizontal and three vertical points on each monitor. The NEC MultiSync 5FG, RasterOps Sweet 16, and Sampo AlphaScan 17e had the lowest pincushion error, whereas the Mirror 16" Trinitron, Samsung SyncMaster 5c, and the Sampo AlphaScan 17 all exhibited large pincushion errors. Fifteen of the monitors we tested have pincushion controls for vertical lines, but none have adjustments for horizontal pincushion. We tested the control-equipped monitors with their optimal settings.

A jittery screen image can contribute to such health problems as eyestrain and headaches. Jitter, swim, and drift are measured in terms of time variance, which is the displacement of a pixel or line over time. Jitter is a very quick movement, and in our testing, we measured it over a period of 1/2 second. Its main effect is to increase the apparent width of lines. Swim is a slower motion, which we measured over a period of 10 seconds. It is perceived as an objectionable waver. Drift is a long-term motion, and we measured it over a period of 60 seconds. Under normal circumstances, this motion is too slow to be perceptible to users, but it can cause registration problems in film-recording systems and overlays.

We used the Microvision Superspot 100 System to measure the amount of jitter, swim, and drift at five locations on the screen for horizontal and vertical lines. The less the time variance, the more stable the display tends to be. The Mitsubishi Diamond Pro 17 and the Apple Macintosh 16" Color Display had the greatest time variance, but none of the products we tested had visible jitter, swim, or drift.

Brightness and Color

A monitor's brightness becomes particularly important if your work requires close examination of graphics. For ergonomic purposes, adjusting brightness may be the best way to customize your view. Brightness is frequently a matter of personal preference.

When we measured the maximum usable screen brightness — how far the brightness control can be turned up without diminishing image sharpness — using a Minolta Color Analyzer CA-100, the Sony CPD-1730 stood out as the brightest of all the monitors. Except for a dim threesome — the E-Machines T-16 II, the Mag InnoVision MX17S, and the

NEC MultiSync 5FG
RATING: ♦♦♦♦
LIST PRICE: $1,355.
STREET PRICE: $1,300.
PROS: Good geometry. Resolution-switching software. 3-year warranty.
CONS: No antiglare treatment. Not FCC Class B-certified.
DISPLAY TECHNOLOGY: Shadow mask.
ACTIVE-SCREEN SIZE (DIAG.): 15 in.
MAX. RESOLUTION: 1,280 x 1,024 pixels.
VIDEO BANDWIDTH: 135 MHz.
VERTICAL-SCAN RATE: 55 – 90 Hz.
HORIZONTAL-SCAN RATE: 27 – 79 kHz.
POWER CONSUMPTION: 155 watts.
COMPANY: NEC Technologies, Wood Dale, IL; 708-860-9500.

NEC MultiSync 5FGe
RATING: ♦♦♦♦
LIST PRICE: $1,155.
STREET PRICE: $1,100.
PROS: Resolution-switching software. 3-year warranty.
CONS: No antiglare treatment.
DISPLAY TECHNOLOGY: Shadow mask.
ACTIVE-SCREEN SIZE (DIAG.): 15.375 in.
MAX. RESOLUTION: 1,024 x 768 pixels.
VIDEO BANDWIDTH: 80 MHz.
VERTICAL-SCAN RATE: 55 – 90 Hz.
HORIZONTAL-SCAN RATE: 31 – 62 kHz.
POWER CONSUMPTION: 100 watts.
COMPANY: NEC Technologies, Wood Dale, IL; 708-860-9500.

Radius PrecisionColor Pivot
RATING: ♦♦♦½
LIST PRICE: $1,149.
STREET PRICE: $900.
PROS: Inexpensive. Pivots between portrait and landscape modes.
CONS: Poor color accuracy. Awkward controls.
DISPLAY TECHNOLOGY: Shadow mask.
ACTIVE-SCREEN SIZE (DIAG.): 13.75 in.
MAX. RESOLUTION: 1,024 x 768 pixels.
VIDEO BANDWIDTH: Unavailable.
VERTICAL-SCAN RATE: 50 – 90 Hz.
HORIZONTAL-SCAN RATE: 30 – 60 kHz.
POWER CONSUMPTION: 100 watts.
COMPANY: Radius, Inc., San Jose, CA; 800-452-5524 or 408-434-1010; 800-966-7360 (fax).

figure 2

Features of Color Monitors / take your pick

The wide variety of color monitors that is available today makes it relatively simple for you to customize your working environment. Autosync monitors provide a large measure of resolution flexibility, whereas the Macintosh-specific variety has the advantage of offering a minimum hassle factor. Antiglare treatments provide a partial barrier to distracting reflections, which can be a cause of eyestrain. FCC Class

	Apple Macintosh 16" Color Display	CTX 1760LR	E-Machines T-16 II	Mag InnoVision MX17S	Mirror 16" Trinitron	Mitsubishi Diamond Pro 17	Mitsubishi Diamond Scan 16	Nanao FlexScan F5501•w	✓ Nanao FlexScan T560i	NEC MultiSync 5FG
832-x-624-pixel resolution	●	●	●	●	●	●	●	●	●	●
1,024-x-768-pixel resolution		●	●	●		●	●	●	●	●
1,280-x-1,024-pixel resolution		●	●	●		●		●	●	●
Mac 16"-display adapter (or cable)	●	*	●	●	●	●	●	●	●	●
Antiglare treatment	●		●			●	●	●	●	
FCC Class B-certified	●	●			●	●	●	●	●	
Energy Star-compliant								●	●	
Fully MPR II-compliant	●		●	●			●	●	●	●
Fully TCO-compliant									●	
30-day money-back guarantee					●					
Warranty (parts) for 1 year		●				●	●			●
Warranty (labor) for 1 year						●	●			●
Depth of 18" or less	●	●			●	●	●	●		
50 lbs or less	●	●			●	●	●	●		

✓ MacUser RECOMMENDS

*Not available from vendor.

†The tube is covered by a 2-year warranty.

RasterOps Sweet 16

RATING: ★★★★½

LIST PRICE: $1,499.

STREET PRICE: $1,175.

PROS: Excellent tech support. Good geometry. 3-year warranty.

CONS: Single-resolution display. No antiglare treatment. Not FCC Class B-certified.

DISPLAY TECHNOLOGY: Shadow mask.

ACTIVE-SCREEN SIZE (DIAG.): 14.625 in.

MAX. RESOLUTION: 832 x 624 pixels.

VIDEO BANDWIDTH: 50 MHz.

VERTICAL-SCAN RATE: 75 Hz.

HORIZONTAL-SCAN RATE: 49.7 kHz.

POWER CONSUMPTION: 100 watts.

COMPANY: RasterOps, Santa Clara, CA; 800-729-2656 or 408-562-4200.

Sampo AlphaScan 17

RATING: ★★★½

LIST PRICE: $995.

STREET PRICE: $850.

PROS: Inexpensive.

CONS: High emissions. Poor tech support. Poor documentation.

DISPLAY TECHNOLOGY: Shadow mask.

ACTIVE-SCREEN SIZE (DIAG.): 15.75 in.

MAX. RESOLUTION: 1,280 x 1,024 pixels.

VIDEO BANDWIDTH: 80 MHz.

VERTICAL-SCAN RATE: 50 – 90 Hz.

HORIZONTAL-SCAN RATE: 30 – 64 kHz.

POWER CONSUMPTION: 110 watts.

COMPANY: Sampo America, Norcross, GA; 404-449-6220; 404-447-1109 (fax).

Sampo AlphaScan 17e

RATING: ★★★

LIST PRICE: $1,295.

STREET PRICE: Unavailable.

CONS: Poor tech support. Poor documentation.

DISPLAY TECHNOLOGY: Shadow mask.

ACTIVE-SCREEN SIZE (DIAG.): 15.75 in.

MAX. RESOLUTION: 1,280 x 1,024 pixels.

VIDEO BANDWIDTH: 100 MHz.

VERTICAL-SCAN RATE: 50 – 90 Hz.

HORIZONTAL-SCAN RATE: 30 – 64 kHz.

POWER CONSUMPTION: 130 watts.

COMPANY: Sampo America, Norcross, GA; 404-449-6220; 404-447-1109 (fax).

B-certified products are rated for residential use. Class A-certified products, on the other hand, are intended for commercial use. If you are concerned about emissions, pick a fully MPR II- or TCO-compliant product.

Because the first problem you will face with a monitor may be lifting it, choose one that won't require a staff bodybuilder and one that will fit easily on your desk.

NEC MultiSync 5FGe	Radius PrecisionColor Pivot	↓ RasterOps Sweet 16	Sampo AlphaScan 17	Sampo AlphaScan 17e	Samsung SyncMaster 5c	Sceptre CL-617	Sigma Ergoview 17	Sony CPD-1604S 17"	↓ Sony CPD-1730	SuperMac SuperMatch 17T	Tatung CM-17MBD	ViewSonic 17
●	●	●	●	●	●	●	●	●	●	●	●	●
●	●		●	●	●	●	●	●	●	●	●	●
			●	●	●	●	●				●	●
●	●	●	●	●	*	*	●	●	●	●	*	●
	●		●	●								●
●	●		●	●		●	●	●	●		●	●
●	●			●			●					●
●		●	●	●		●		†	†			●
●		●										
	●	●	●	●	●	●		●	●		●	●
	●	●	●		●	●		●	●		●	●

Samsung SyncMaster 5c

RATING: ●●●

LIST PRICE: $1,399.

STREET PRICE: $925.

PROS: Inexpensive.

CONS: High emissions. Poor focus. Dull colors. Uneven brightness. Mac 16"-display adapter not available from vendor. No antiglare treatment. Not FCC Class B-certified.

DISPLAY TECHNOLOGY: Shadow mask.

ACTIVE-SCREEN SIZE (DIAG.): 15.5 in.

MAX. RESOLUTION: 1,280 x 1,024 pixels.

VIDEO BANDWIDTH: 100 MHz.

VERTICAL-SCAN RATE: 50 – 90 Hz.

HORIZONTAL-SCAN RATE: 30 – 65 kHz.

POWER CONSUMPTION: 140 watts.

COMPANY: Samsung, Ridgefield Park, NJ; 201-229-4000.

Sceptre CL-617

RATING: ●●●½

LIST PRICE: $950.

STREET PRICE: $900.

PROS: Inexpensive.

CONS: High emissions. Poor tech support. Mac 16"-display adapter not available from vendor. Poor documentation. No antiglare treatment. Awkward controls.

DISPLAY TECHNOLOGY: Shadow mask.

ACTIVE-SCREEN SIZE (DIAG.): 15.5 in.

MAX. RESOLUTION: 1,280 x 1,024 pixels.

VIDEO BANDWIDTH: 110 MHz.

VERTICAL-SCAN RATE: 50 – 90 Hz.

HORIZONTAL-SCAN RATE: 30 – 66 kHz.

POWER CONSUMPTION: 140 watts.

COMPANY: Sceptre Technologies, Inc., Placentia, CA; 800-788-2878 or 714-993-9193; 714-993-2997 (fax).

Sigma Ergoview 17

RATING: ●●●½

LIST PRICE: $1,349.

STREET PRICE: $1,125.

PROS: Good spatial uniformity.

CONS: No antiglare treatment.

DISPLAY TECHNOLOGY: Trinitron.

ACTIVE-SCREEN SIZE (DIAG.): 16 in.

MAX. RESOLUTION: 1,280 x 1,024 pixels.

VIDEO BANDWIDTH: 120 MHz.

VERTICAL-SCAN RATE: 50 – 120 Hz.

HORIZONTAL-SCAN RATE: 30 – 68 kHz.

POWER CONSUMPTION: 130 watts.

COMPANY: Sigma Designs, Inc., Fremont, CA; 800-845-8068 or 510-770-0100; 510-770-2640 (fax).

Mitsubishi Diamond Scan 16, which were more than 15 percent darker than average — the rest exhibited medium (generally acceptable) brightness.

Spatial uniformity, another measure of brightness, is the degree to which a monitor's luminance is evenly distributed across the screen. The Apple Macintosh 16" Color Display won the day (with a variance in brightness of only 3.11 percent), followed closely by the Sigma Ergoview 17. The Samsung SyncMaster 5c monitor fell noticeably behind the rest of the pack, with a variance of 14 percent.

Color tracking is a measure of how accurately a monitor responds to the signals for red, green, and blue. When we pointed the Minolta Color Analyzer CA-100 at each monitor, measuring color tracking with levels ranging from 0 to 100 percent, we calculated each display's color-tracking correctness, which is expressed in terms of percentage of the maximum. Nine of the monitors exceeded 90 percent, which is considered very good. The E-Machines T-16 II and Mag InnoVision MX17S both exceeded 97 percent. The Radius PrecisionColor Pivot and Nanao FlexScan T560i brought up the rear of the monitor pack with scores below 80 percent.

Pick Your Resolution

Sharpness is not synonymous with high resolution. The latter is dictated by your Mac — more specifically, by its video card or built-in video circuitry and memory — and is simply the number of pixels on-screen.

Only 2 of the monitors we tested — the Apple Macintosh 16" Color Display and the RasterOps Sweet 16 — have a single fixed resolution of 832 x 624 pixels. The SuperMac SuperMatch 17T offers the Macintosh standards: 640 x 480, 832 x 624, and 1,024 x 768 pixels. The rest of them use autosync technology to lock to any of a wide range of frequencies and resolutions.

With a suitable video card installed in your Macintosh, 14 of the monitors we tested can handle resolutions as high as 1,280 x 1,024 pixels. Any of these autosync monitors can be employed with Macintosh computers as well as with PCs. Better still, they are able to adapt to whatever else may come along in the future. The Apple, RasterOps, and SuperMac monitors tie you to today's Macintosh resolution standards.

Outside the Box

Two important external-monitor features come standard (or almost standard) in our group of products. Each has the swivel base recommended by ergonomic experts, and only three of them (the Radius PrecisionColor Pivot, the Sceptre CL-617, and the SuperMac SuperMatch 17T) do not have the brightness and contrast controls on the front of the monitor.

Sony CPD-1604S 17"
RATING: ★★★½
LIST PRICE: $1,220.
STREET PRICE: $1,150.
PROS: Excellent controls.
CONS: No antiglare treatment.
DISPLAY TECHNOLOGY: Trinitron.
ACTIVE-SCREEN SIZE (DIAG.): 16.28 in.
MAX. RESOLUTION: 1,024 x 768 pixels.
VIDEO BANDWIDTH: 60 MHz.
VERTICAL-SCAN RATE: 50 – 87 Hz.
HORIZONTAL-SCAN RATE: 28 – 57 kHz.
POWER CONSUMPTION: 120 watts.
COMPANY: Sony Electronics, Inc., San Jose, CA; 800-352-7669 or 408-894-0555.

Sony CPD-1730
RATING: ★★★★
LIST PRICE: $1,330.
STREET PRICE: $1,125.
PROS: Very bright.
CONS: No antiglare treatment.
DISPLAY TECHNOLOGY: Trinitron.
ACTIVE-SCREEN SIZE (DIAG.): 16.05 in.
MAX. RESOLUTION: 1,024 x 768 pixels.
VIDEO BANDWIDTH: 60 MHz.
VERTICAL-SCAN RATE: 50 – 87 Hz.
HORIZONTAL-SCAN RATE: 28 – 58 kHz.
POWER CONSUMPTION: 130 watts.
COMPANY: Sony Electronics, Inc., San Jose, CA; 800-352-7669 or 408-894-0555.

SuperMac SuperMatch 17T
RATING: ★★★★
LIST PRICE: $1,249.
STREET PRICE: $1,050.
PROS: Inexpensive. Good color accuracy. Good spatial uniformity.
CONS: No antiglare treatment. Not FCC Class B-certified. Awkward controls.
DISPLAY TECHNOLOGY: Trinitron.
ACTIVE-SCREEN SIZE (DIAG.): 14.75 in.
MAX. RESOLUTION: 1,024 x 768 pixels.
VIDEO BANDWIDTH: 80 MHz.
VERTICAL-SCAN RATE: 74.5 – 74.9 Hz.
HORIZONTAL-SCAN RATE: 49.7 – 60.2 kHz.
POWER CONSUMPTION: 150 watts.
COMPANY: SuperMac, Sunnyvale, CA; 800-334-3005 or 408-541-6100.

PC users tend to make a big deal about the location and type of controls, because they are forced to switch resolutions several times a day when shifting among programs. Macintosh computers don't suffer from such a surfeit of standards, so image-adjusting controls aren't a major concern.

Service After the Sale

Monitor warranties vary, depending on the manufacturer. Among the products we tested, the best warranty — a three-year one — is offered by Mitsubishi, NEC, RasterOps, and ViewSonic.

Whether you use a monitor's warranty or not, tech support can come in handy when you're setting a system up for the first time. We called each of the vendors represented in this article to ask several common tech-support questions. We didn't let the staff know who we were, and we rated each company on the correctness of the representatives' answers and their accessibility (how quickly they returned our phone calls).

We found that vendors with a fair amount of experience in the Mac market generally provided better tech support than those whose focus is primarily on the PC and compatibles. The exception was SuperMac, which missed one question on two separate attempts. Interestingly, E-Machines, which is owned by SuperMac, scored much better.

Not every one of the PC-oriented vendors failed to meet the tech-support challenge. Mitsubishi, NEC, Sony, and Tatung scored very well. The weakest tech support came from CTX, Sampo, and Sceptre.

Making a Decision

Ergonomic and emission concerns can become religious issues. People either feel that they should be primary factors in selecting a monitor or that they're unimportant, promulgated by alarmists. Whichever camp you find yourself in, a good look at the monitors in this report should leave you with one that meets your needs.

The RasterOps Sweet 16 delivered the best images of all the products we tested. Its main drawback is its single-frequency display, which makes it an inappropriate choice for those who are interested in using the same monitor with PCs and Macintoshes. The Sony CPD-1730, which came in right behind the Sweet 16 in our tests, offers a great autosync alternative, particularly for those who are interested in an extremely bright display. Nanao's FlexScan T560i, another good-looking autosync, is expensive, but it offers some unique features such as Power Save and compliance with the TCO emissions standard.

Winn L. Rosch is the author of *The Winn L. Rosch Hardware Bible*. Brian Fikes and Katie Barnes, ZD Labs project leaders, managed the testing for this report.

Tatung CM-17MBD
RATING: ♦♦♦♦
LIST PRICE: $1,299.
STREET PRICE: $900.
PROS: Inexpensive.
CONS: Bluish display. Mac 16"-display adapter not available from vendor. No antiglare treatment.
DISPLAY TECHNOLOGY: Shadow mask.
ACTIVE-SCREEN SIZE (DIAG.): 15.8 in.
MAX. RESOLUTION: 1,280 x 1,024 pixels.
VIDEO BANDWIDTH: 100 MHz.
VERTICAL-SCAN RATE: 50 – 90 Hz.
HORIZONTAL-SCAN RATE: 29 – 65 kHz.
POWER CONSUMPTION: 120 watts.
COMPANY: Tatung, Long Beach, CA; 800-827-2850 or 310-637-2105; 310-637-8484 (fax).

ViewSonic 17
RATING: ♦♦♦½
LIST PRICE: $1,299.
STREET PRICE: $1,050.
PROS: Very sharp image quality. Bright colors. 3-year warranty.
CONS: High pincushion error.
DISPLAY TECHNOLOGY: Shadow mask.
ACTIVE-SCREEN SIZE (DIAG.): 15.5 in.
MAX. RESOLUTION: 1,600 x 1,280 pixels.
VIDEO BANDWIDTH: 135 MHz.
VERTICAL-SCAN RATE: 50 – 120 Hz.
HORIZONTAL-SCAN RATE: 30 – 82 kHz.
POWER CONSUMPTION: 140 watts.
COMPANY: ViewSonic, Walnut, CA; 800-888-8583 or 909-869-7976; 909-869-7958 (fax).

SONY

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CIRCLE **72** ON READER SERVICE CARD

PHOTOGRAPHY / LEON

Professional Page Layout

Time to Switch?

Recent upgrades add snazzy features to PageMaker and QuarkXPress.

SEVEN YEARS. That's how long PageMaker and QuarkXPress have been slugging it out for control of the high-end desktop-publishing market. Aldus PageMaker, the program that's synonymous with desktop publishing, seemed invincible at first. But upstart QuarkXPress (from Quark) became a strong competitor in the professional publishing community, with features designed for

By Kathleen Tinkel and Cheryl England

heavy-duty production. Conventional wisdom now has it that QuarkXPress is the choice for professional publishing and PageMaker is better suited for the layout traditionalists.

With PageMaker 5.0, however, Aldus is fighting back. This latest version puts PageMaker on a par with QuarkXPress in several areas and ahead of it in others. But Quark hasn't been resting on its laurels. QuarkXPress 3.2 ups the ante again and adopts some of PageMaker's better features as well. And Quark has announced yet another update, version 3.3, scheduled for release by the time you read this. So the beat goes on.

This kind of features war is enough to send desktop publishers scrambling for their secret decoder rings. To help you sort through the maze, we've identified six areas critical to the publishing process — page layout, typography, color, automation, extensibility, and output — and evaluated PageMaker 5.0 and QuarkXPress 3.2 in those terms. By understanding each program's strengths and weaknesses in these areas, you'll be well equipped to make your first high-end page-layout purchase or to make the leap to a new program. If you decide that neither is quite right but still want solid capabilities, check out the closest competitors: Manhattan Graphics' Ready,Set,Go! (see the "Ready,Set,Go!" sidebar) and Frame Technology's FrameMaker (see the "FrameMaker" sidebar).

Laying Out Pages

ADVANTAGE: QUARKXPRESS

Both Aldus and Quark have enhanced their programs' essential layout functions. PageMaker (finally) permits you to have more than one publication open at a time, and both programs allow tiled, or overlaid, publication windows to appear on the screen. (Tiling makes it easy to drag elements from one publication to another.)

PageMaker's revised Control palette outstrips QuarkXPress' Measurement palette, both in functionality and in ease of use (see figure 1). PageMaker's Control palette also has an intelligent tabbing feature that's handy for controlling the attributes of text blocks, graphics, and other elements. The key is learning it, though — it's far from intuitive at first. (PageMaker's other features retain their ease of use.)

PageMaker has the edge in long-document handling (although if publishing books or technical documents is your focus, you should turn to FrameMaker 4.0). PageMaker supports indexing, automatic table-of-contents creation, and linked-document printing; to add these functions to QuarkXPress, you must use scripting or third-party XTensions. Neither PageMaker nor QuarkXPress, however, can apply footnotes, a serious deficiency for any publishing software.

QuarkXPress has an important advantage over PageMaker when it comes to master pages. QuarkXPress allows as many as 127 user-defined master pages, whose contents can be moved or deleted in the document. PageMaker has just one static set of master pages (left and right).

QuarkXPress 3.2 sports faster display functions, and Quark says version 3.3 will add interruptible screen redraw (a feature PageMaker introduced with 4.2). But Quark took a step backward in version 3.2 by removing the ability to apply

The Bottom Line

THE TWO HIGH-END PAGE-LAYOUT PROGRAMS — PageMaker and QuarkXPress — recently underwent major upgrades. But are the added capabilities enough to make you switch from one program to the other? To help you decide, we rate each program on value, customer service, type-handling capabilities, and color management.

⊕ = OUTSTANDING
● = ACCEPTABLE
⊖ = POOR

	PRICE/ PERFORMANCE	CUSTOMER SERVICE	TYPOGRAPHY	COLOR MANAGEMENT
★★★★ Aldus PageMaker	⊕	●	⊕	●
★★★★ QuarkXPress	⊕	●	●	⊕

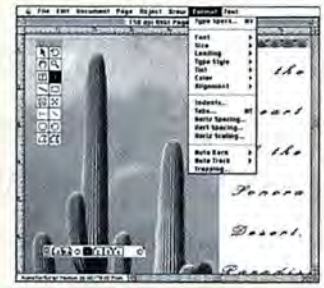
An old favorite gets better. PageMaker ($895 list, $589 street) still leads in ease of use, thanks to a host of elegantly implemented features such as styles, tiled pages, and font management. And this new version adds some much needed functionality: built-in color separation, support for manual trapping, and editable tracking.

Excellent automation features such as automatic trapping, the ability to create numerous master pages, and support for the EfiColor color-management system make QuarkXPress ($895 list, $599 street) the choice for heavy production work. A powerful tagging language and numerous add-ons augment QuarkXPress' strengths.

Ready,Set,Go! / trying harder

READY,SET,GO! WANTS TO PLAY WITH THE BIG GUYS, but it scores better when it hangs out with some of its lower-end buddies. Some of its features compare favorably with those in PageMaker and QuarkXPress: You can apply its style sheets to selected text, not just whole paragraphs, and the program creates more-graceful ragged text than either PageMaker or QuarkXPress. Like PageMaker, Ready,Set,Go! includes its own scripting language, and like QuarkXPress, it can separate CMYK TIFF, DCS, EPS, and RGB TIFF files as well as any graphic element created within the program.

Professional-level features include a printer-settings file you can calibrate and support for explicit trapping functions, accurate to .001 point. Ready,Set,Go! even offers some features that neither PageMaker nor QuarkXPress does — empty text frames can carry style-sheet information (this method is more effective than using templates if you need to divide production tasks), and there's a grid system for organizing layouts. Not bad

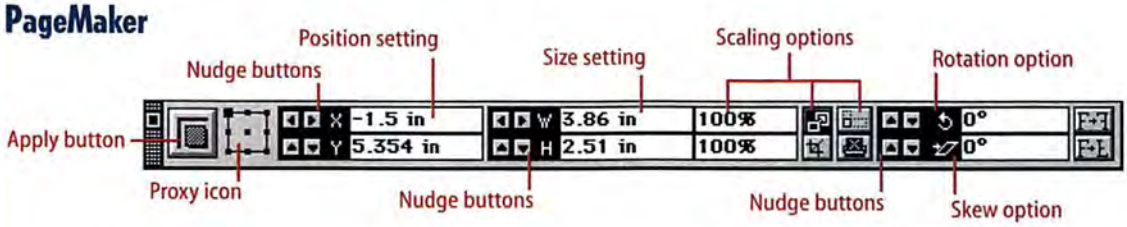


Ready,Set,Go!'s Format menu offers a lot of functions — including, confusingly enough, the Trapping dialog box.

figure 1

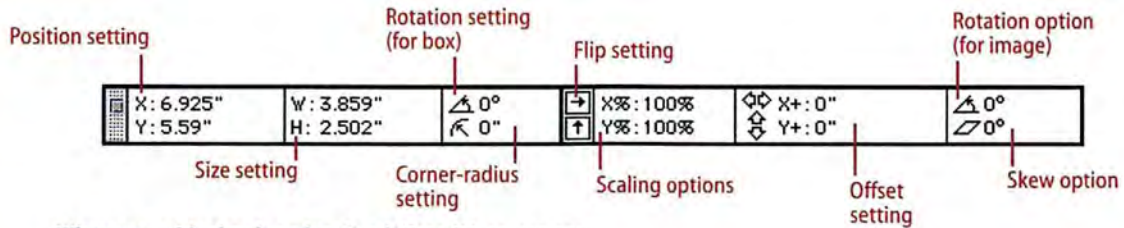
Control Palettes / who's got what

PageMaker



PageMaker's Control palette displays a Proxy icon, which you use to set the reference point for an object. The reference point serves as the base from which the Control palette implements changes.

QuarkXPress



When a graphics box is active, QuarkXPress' Measurement palette displays the applicable settings.

master pages via the Document Layout palette. Quark plans to restore this in version 3.3, thanks to user outrage.

Setting Type

Type is the backbone of most publications, so you would expect PageMaker and QuarkXPress to have excellent typographic capabilities. Unfortunately, this isn't the case. With manual twiddling, for a program that lists for less than half the price of the high-end contenders.

Ready,Set,Go!'s functions are more awkward than those in PageMaker and QuarkXPress, though. Setting specifications for paragraphs and hyphenation and justification takes you on a bewildering trek through six dialog boxes you access via three menus. You turn automatic kerning on in one dialog box and set its threshold in another. In fact, the menus are a mess — the Format menu deals entirely with type specs, but that's also where you find the Trapping dialog box. Hyphenation specifications are on the Document menu, but you go to the Text menu to turn hyphenation on. All this leads to a good deal of head scratching until you've committed the locations to memory.

Other functions are nonexistent. Ready,Set,Go! cannot generate an index or a table of contents, and it doesn't include such niceties as "Continued on" lines or automatic saves. Nor can you add these features through third-party add-on software — the only software add-ons (Annexes) available are shipped with the program.

And then there are the bugs. The version of the program we worked with (6.0.2) crashed frequently, usually after a drastic move such as trying to place a graphics file. Fortunately, the program didn't corrupt any files.

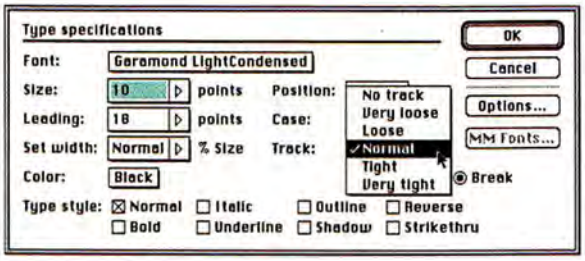
Ready,Set,Go! is better than other inexpensive layout programs, thanks to its relatively professional-caliber feature set and unlimited free technical support. Not everyone needs the complexity of PageMaker or QuarkXPress. If you're in the market for a decent page-layout tool that has the ability to output color separations and good control over kerning, you may want to give Ready,Set,Go! a shot. / Kathleen Tinkel

Ready,Set,Go! 6.0.2

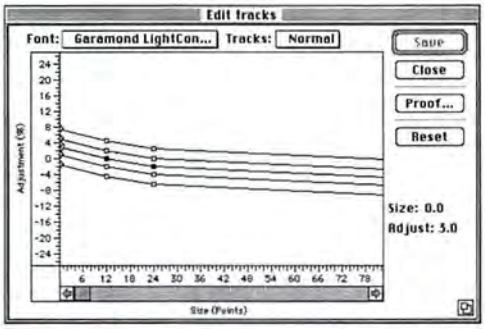
LIST PRICE: $395; upgrade, $69.95.
STREET PRICE: $290.
PROS: Good page-layout tools and professional-standard control of type and images. Low price. Unlimited free technical support. Inclusion of layout grids. Frames can carry style-sheet information.
CONS: No third-party software add-ons. Awkward implementation of many functions. Confusing menus and dialog boxes. Inability to generate an index or table of contents. Lack of cross-platform capability.
NO. OF MASTER PAGES: 26 sets (left and right).
KERNING AND TRACKING PRECISION: .001 em.
FOREIGN-LANGUAGE DICTIONARIES: Nine language dictionaries and 18 hyphenation dictionaries, $99.95 each.
FILE FORMATS PROGRAM CAN SEPARATE: CMYK TIFF, DCS, EPS, RGB TIFF.
NO. OF SOFTWARE ADD-ONS: Seven included; no third-party.
TECHNICAL SUPPORT: Unlimited; toll-free.
COMPANY: Manhattan Graphics Corp., Hartsdale, NY; 800-572-6533 or 914-725-2048; 914-725-2450 (fax).

figure 2

Track Editing / single-level versus multilevel



PageMaker's editable tracks work like those on some dedicated typesetting systems. The Normal track is well suited to many faces; the other tracks achieve specific typographic effects. (Tracking lets you set the amount of space between characters.)



In addition to providing suitable default tracks, PageMaker lets you build your own tracking tables for any font.

you can set professional-looking type in either program, but they both still fall short of the expectations established a decade ago by dedicated typesetting systems. For instance, good features for creating hanging punctuation and an effective way to control ragged type are still missing from both programs.

Kerning

ADVANTAGE: PAGEMAKER

Both of the programs honor the kern pairs built in to fonts. QuarkXPress' default threshold is 10 points; PageMaker's threshold is 4 points, which ensures that virtually all type is kerned. You can change QuarkXPress' threshold to a smaller type size for professional-quality work. PageMaker has long allowed users to kern pairs that include a space as one of the characters. Quark promises to offer the same function in version 3.3.

On the flip side, QuarkXPress has offered numeric control of manual kerning in the last several versions. PageMaker only now lets you specify kerning values for selected pairs or for a range of text via the Control palette. QuarkXPress still has finer kerning increments, however.

PageMaker's new gee-whiz feature — the Expert Kerning Addition, from URW — automates kerning for a selected range of text. This utility is a mixed blessing. It "looks" at character outlines and adds or reduces the space between characters to produce even typographic *color* (the difference between the dark areas formed by dense type and the light areas formed by loose type). The Expert Kerning Addition's controls are too limited, however, and often compromise readability for the sake of color. But using the Addition does give you a head start on manual kerning.

Tracking

ADVANTAGE: PAGEMAKER

The character spacing that is built in to a font is based on a particular type size

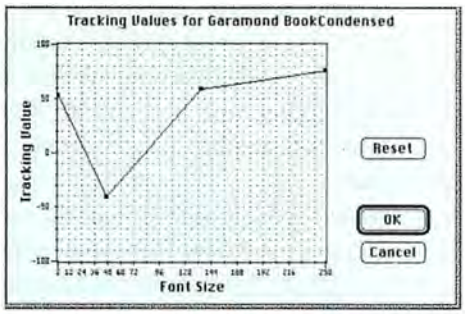
FrameMaker / for technical and long documents

IN ALL THE HOOPLA over PageMaker 5.0 and QuarkXPress 3.2, you might have missed the news about the latest FrameMaker upgrade. FrameMaker 4.0, from Frame Technology, sports a completely overhauled interface and a batch of new features — many of which no other page-layout program offers.

FrameMaker is targeted at professionals who create, edit, and manage long or technical documents. Its emphasis is not on precise typographical control, text wrap, or the other fineries of traditional desktop publishing but on supplying the high-end, sophisticated tools needed to create and update such complex documents as manuals, technical and financial reports, and on-line publications. Chances are, several of the software manuals gathering dust on your bookshelf were created with FrameMaker.

What does FrameMaker have that other programs don't? Automatic numbering of elements, an equation editor, running headers and footers, paragraph *and* character styles, conditional text, a vector-based graphics environment for creating illustrations, and hypertext links for creating interactive on-line publications. The program also supports *variables* — changeable items such as dates that appear throughout the document. Once you've defined variables, you can place them in the document as often as you wish; when you change a variable's definition, FrameMaker automatically updates all of the variables in the document.

In page view, FrameMaker generally displays a tool bar, a floating tool palette, and various style catalogs.



QuarkXPress' single-track system is less flexible than PageMaker's multilevel system, and the tracking values you set for a typeface apply to that typeface everywhere it appears in a document.

— often from 10- to 12-point for text faces and from 18- to 24-point for display. Desktop publishing systems allow you to use a font at any size, but when a single font outline is scaled to a wide range of sizes, the letter spacing is thrown out of proportion. Tracking compensates for these spacing problems.

With five editable tracks, PageMaker's tracking is much more sophisticated than QuarkXPress'. You use the Normal track to adjust spacing for shifts in point size and the Very Loose, Loose, Tight, and Very Tight tracks to achieve specific typographic effects.

Prior to version 5.0, the default tracks of PageMaker were generally too tight and you could modify them only by using an application called PM Tracker, from Edco Services. PageMaker 5.0 has good default tracks, and it ships with an Addition that lets you build your own tracks for any font you want. You can turn PageMaker's tracking on or off as a character attribute, and you can incorporate it into styles.

QuarkXPress' single-track system is less flexible than PageMaker's — it applies to a selected typeface everywhere that face is used throughout a document (so you can't use style sheets to apply tracking). Because of this, few QuarkXPress users bother with the program's tracking function. Instead, most use what Quark also refers to as tracking but which is really manual kerning that is applied to a selected range of text and can be recorded in style sheets and implemented by Option-Shift-click. Unfortunately, most users apply this tracking (or a similar function in PageMaker called range kerning) on an ad hoc basis to fix widows and solve other copy-fitting problems; this usually leads to type of poor color.

Hyphenation and Justification

ADVANTAGE: PAGEMAKER

Both PageMaker and QuarkXPress sport updated defaults for minimum, maximum, and optimum word and character spacing. But although word spacing and letterspacing are meant to work together, neither PageMaker's nor QuarkXPress' defaults are more than about half right. PageMaker's default controls for word spacing are more conservative and provide better control over spacing than do QuarkXPress' default settings.

Because QuarkXPress uses algorithms to hyphenate words, you sometimes end up with odd breaks. PageMaker lets you choose between a dictionary-based approach or an algorithmic method (which checks for nonstandard hyphenations). On the other hand, QuarkXPress lets you specify the smallest word you want the program to hyphenate, the minimum number of characters you will tolerate before and after the hyphen, and whether or not capitalized words can be broken.

A few other typographic features are worth noting: Each program now supports smart quotes and includes a baseline-shift function. QuarkXPress 3.2 adds vertical font scaling to the horizontal scaling in previous versions. Now you can adjust both dimensions unequally in one dialog box.

Those who handle a lot of tabular data — publishers of large databases, for example — will appreciate FrameMaker's table editor. Designed to automate table creation, the editor offers such handy features as the ability to shade every other row. FrameMaker also supports multichapter book building, multilevel tables of contents, index generation, figure-list generation, and superior input control (for instance, you can prevent users from entering two consecutive spaces as they enter data). Finally, FrameMaker offers remarkably good cross-platform compatibility among its Mac, Windows, and UNIX versions.

FrameMaker 4.0 also sports an updated interface. Tool bars for easy access to frequently used formatting commands and program features grace the screen, as do streamlined menus and dialog boxes. FrameMaker supports the XTND file-translation technology, so you can import a wide variety of file formats. Process-color-separation support, a thesaurus, a word-count function, and a document-comparison feature round out the enhancements. / Gregory Wasson

FrameMaker 4.0

LIST PRICE: $895; upgrade, $195.
STREET PRICE: $599.
PROS: Many high-end features for creating technical and long documents, including automatic numbering of elements, figure-list generation, and running headers and footers. Excellent table editor. Good cross-platform compatibility.
CONS: No fine typographic control. No text wrap. No pasteboard. Only one software add-on.
NO. OF MASTER PAGES: Unlimited.
KERNING AND TRACKING PRECISION: Based on a percentage of user's font metrics.
FOREIGN-LANGUAGE DICTIONARIES: Three language packs: The Americas, Central Europe, and Scandinavia, $95 each.
FILE FORMATS PROGRAM CAN SEPARATE: CMYK TIFF, DCS, EPSF.
NO. OF SOFTWARE ADD-ONS: None included; one third-party.
TECHNICAL SUPPORT: Free for 30 days from time of first call; unlimited toll-free support, $99 per year.
COMPANY: Frame Technology, San Jose, CA; 800-843-7263 (sales), 800-537-2634 (upgrades), or 408-433-3311; 408-433-1928 (fax).

The 10 Best Things About QuarkXPress

1. A wide variety of **XTensions** for customizing the program.
2. A powerful **tagging language** for styling text.
3. Support for as many as **127 master pages** for formatting document pages.
4. Supports the **EfiColor** color-management system.
5. Precise **measurements** for detailed work.
6. A **frame-based structure** that aids in production.
7. Seven **control palettes** for quickly accessing features.
8. **Libraries** — collections of items you can reuse. There's no limit to the number of libraries you can create, and open libraries appear as on-screen palettes.
9. **Anchored text and graphics boxes,** which act like characters, flowing with the text in which they are embedded.
10. Automatic **trapping.**

Font Management

ADVANTAGE: PAGEMAKER

One of the most vexing problems in moving documents from one platform or system to another is the lack of consistency in fonts and font names. Each program posts an alert if you open a new file that calls for fonts your Mac doesn't have, and each gives you the opportunity to substitute an available font. That's all QuarkXPress does.

PageMaker's font-matching approach goes beyond that. You can choose between two sorts of font substitution: PANOSE, which allows you to map one real font to another; or SuperATM, which creates a font of the right weight and width on the fly. You can also use both, making one the primary resource.

Substitutions can be temporary or can apply every time you call for a particular font. For instance, if a font has been updated, you can tell PANOSE to always replace the old version with the updated one. You can also have the utility automatically use the Mac version of a font when opening a PC file, and you can substitute a different manufacturer's version of a typeface — Bitstream's Zapf Calligraphic 801 in place of Apple's version of Palatino, for example.

Setting Tables

ADVANTAGE: NEITHER

The tab functions in PageMaker and QuarkXPress are similar (and similarly inadequate). The Table Editor that was included with PageMaker 4.0, inadequate though it was, isn't bundled in PageMaker 5.0. You can purchase a table XTension for QuarkXPress, but the ones available are expensive and still won't solve all of your table-creation problems. If creating tables is a major part of your job description, prepare yourself for a lot of manual labor or consider using FrameMaker.

Working with Color

In the recent past, QuarkXPress' color handling was several steps ahead of PageMaker's. Earlier versions of QuarkXPress could separate some color files directly and supported automatic trapping. Both functions have been strengthened in version 3.2.

PageMaker separations had to be created with a separate application, Aldus PrePrint, and there was no support for trapping. But with version 5.0, PageMaker is beginning to catch up. It can knock out or overprint any object, thereby enabling simple manual trapping, and most color files can be separated directly from within the program.

Color Management

ADVANTAGE: QUARKXPRESS

PageMaker 5.0 has taken great strides in the way it handles color: It can now separate CMYK TIFF, DCS, and EPS files directly and also automatically adds spot colors from imported EPS files to the color palette (Quark claims that QuarkXPress 3.3 will include this function as well). PageMaker still requires PrePrint for separating files that contain RGB TIFF images, however. PageMaker also has an elegant feature for assigning two colors to a single plate, useful when the same Pantone color has different names or merely to save film when you're processing color pages in which no two color objects overlap.

QuarkXPress 3.2
RATING: ♦♦♦♦
LIST PRICE: $895; upgrade, $195.
STREET PRICE: $599.
PROS: Many good features for automating production. Automatic trapping. Support of EfiColor color-management system. Powerful tagging language. Precise kerning increments. Numerous third-party XTensions.
CONS: Weak font-substitution features. Only limited tracking features. Lack of native scripting language. Poor table-creation tools.
NO. OF MASTER PAGES: 127.
KERNING AND TRACKING PRECISION: .00005 em.
FOREIGN-LANGUAGE DICTIONARIES: One 13-language dictionary, $1,599.
FILE FORMATS PROGRAM CAN SEPARATE: CMYK TIFF, DCS, EPS, RGB PICT, RGB TIFF.
NO. OF SOFTWARE ADD-ONS: One included, more than 200 third-party.
TECHNICAL SUPPORT: 90 days free from date of purchase; One-Year Service Plan, $150; 30-Day Service Plan, $35; Service Plus (toll-free priority access), $2,000 and $150 per copy of QuarkXPress.
COMPANY: Quark, Inc., Denver, CO; 800-676-4575 or 303-894-8888; 303-343-2086 (fax).

WE'RE REDEFINING
WHAT YOU
SHOULD EXPECT
FROM
OFFICE PRINTERS.

But QuarkXPress maintains a wide lead in color management. The program ships with the EfiColor XTension, which uses device profiles to ensure that you get the best possible color matching between a scanned image or QuarkXPress graphic and the printed page. The EfiColor XTension also lets you separate CMYK TIFF, DCS, EPS, and RGB TIFF files. Aldus reports that the next version of PageMaker will support color management via Kodak's Precision Color technology.

The 10 Best Things About PageMaker

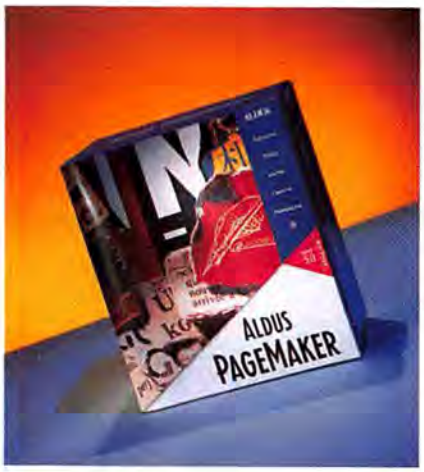
1. An **elegant interface.**
2. A **font-mapping utility** that eases font-substitution problems.
3. The **Story Editor,** a word processor that lets you create and edit text within PageMaker.
4. A feature-packed **Control palette** for quickly applying character and paragraph attributes.
5. An efficient "based-on" **method of creating styles.**
6. Flexible **kerning and tracking** features.
7. Built-in **support for separating** CMYK TIFF, DCS, and EPS files.
8. The ability to **add spot colors** from imported EPS files to the color palette.
9. Object-level **trapping.**
10. **Long-document-handling features** such as indexing, automatic table-of-contents generation, and linked-document printing.

Trapping

ADVANTAGE: QUARKXPRESS

Trapping — a set of techniques that compensate for misregistration of adjacent colors on a printing press — is one of the trickier color issues. Automatic trapping is one of QuarkXPress' sexiest features, but it can present problems. The program ships with autotrapping turned on, so color text in a white area will spread just because its text box dangles into a color object somewhere else on the page. Another problem: The trapping palette sometimes indicates an object is trapped when it isn't. Also, autotrapping does not work with imported EPS files. You must trap such files manually in Adobe Illustrator or Aldus FreeHand or have a service bureau trap them for you.

PageMaker 5.0 and QuarkXPress 3.2 each let you manually create some simple chokes and spreads by specifying *knockout* or *overprint* (methods for preventing inaccurate colors and gaps between overlapping objects) on an object-by-object basis. In PageMaker, you can also draw a *keyline* around an object (keylines help you trap gray-scale images on color backgrounds). In general, though, Aldus' strategy calls for files to be trapped with the kind of trapping and stripping software found mostly at service bureaus (Aldus hopes, of course, that this software will be its own TrapWise product). Many operators at commercial print shops agree with this approach. After all, the need for trapping arises as a result of the printing process, so a print professional is in the best position to specify trapping values.



Aldus PageMaker 5.0
RATING: ★★★★
LIST PRICE: $895; upgrade, $150.
STREET PRICE: $589.
PROS: Intuitive interface. Good kerning and tracking features. Ability to separate most color files directly. Good style-sheet support. Good scripting language. Inclusion of LaserWriter 8.0 PPD profiles.
CONS: Inability to separate RGB TIFF files directly. No color-management system. Limited AppleScript support. Poor table-creation tools.
NO. OF MASTER PAGES: One set (left and right).
KERNING AND TRACKING PRECISION: .01 em.
FOREIGN-LANGUAGE DICTIONARIES: One 19-language dictionary, $99.
FILE FORMATS PROGRAM CAN SEPARATE: CMYK TIFF, DCS, EPS, PICT (PrePrint can separate RGB TIFF).
NO. OF SOFTWARE ADD-ONS: 20+ included; 60+ third-party.
TECHNICAL SUPPORT: 90 days free from first call; CustomerFirst Premier (toll-free priority-access number), $179 per year; CustomerFirst Basic (toll-free number), $99 per year; 900-number, $20 per call or $2 per minute.
COMPANY: Aldus Corp., Seattle, WA; 206-628-2320.

Automating Your Work

A friend whose typesetting company converted from conventional systems to Macs said each of his typesetters used to produce 12 jobs per shift but that now the average is closer to 8 or 9. The WYSIWYG that enables newcomers to set type slows things down for professionals accustomed to working with codes in an unformatted, fast-moving ASCII text stream. Thanks to style sheets, tags, and scripting, today's programs are recovering some of that lost speed, however.

Styles

ADVANTAGE: PAGEMAKER

PageMaker has the edge in style implementation. Like Microsoft Word, it uses a "based on" method of creating styles. If you define a style called Text and use it as the basis for styles called Bulleted Text and Captions, for example, changing the typeface in Text will change the typeface in the related styles as well — without affecting other attributes such as type size or paragraph treatment.

Although QuarkXPress' style sheets are similar to PageMaker's styles, subtle

Flexibility (ˌflek·sə·ˈbil·ət·ē) *n.* 1, A feature previously not found in this category. *example:* For under $800, **TI microWriter™** printers with **Adobe® PostScript®** give you more networking and paper handling *flexibility* than Apple and HP, at a lot lower price.

THE UNDER $800 PRINTER, REDEFINED.

If you're looking for a PostScript printer with a street price well under $800, you'll have a hard time finding one with as many features as a TI microWriter.

Just look at the chart and compare it to our leading competitors, Apple and HP. Then, when you're ready for a full-featured printer that's truly flexible, at a price that's truly affordable, take a look at a TI microWriter. For more information or a dealer near you, call *1-800-527-3500.*

		TI microWriter PS23	Apple LaserWriter Select 310	HP 4ML
Print Speed		*5 ppm*	*5 ppm*	*4 ppm*
AppleTalk® Connection		*Standard*	*Not Avail.*	*Standard*
Paper Trays	*(std.)*	*250 sheet*	*250 sheet*	*100 sheet*
	(opt.)	*250 sheet*	*250 sheet*	*Not Avail.*
Auto Emulation Switching		*Standard*	*Not Avail.*	*Standard*
List Price		*$799*	*$1079*	*$1279*

EXTENDING YOUR REACH WITH INNOVATION™

TEXAS INSTRUMENTS

Adobe PostScript · MAC HOME JOURNAL

Specifications in chart are based on information as of 12/93. microWriter and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. AppleTalk is a registered trademark of Apple Computer, Inc. © 1993 TI.

CIRCLE **138** ON READER SERVICE CARD

Compatibility (kəm·ˌpat·ə·ˈbil·ət·ē) *n.* 1, A feature typically lacking in this category. *example:* The new **600 dpi TI microLaser™ Pro 600** printer gives you Mac,® DOS, Windows, PostScript® and PCL5 *compatibility* standard; Apple and HP charge hundreds more.

PC MAGAZINE EDITORS' CHOICE
November 23, 1993
TI microLaser Pro 600

Adobe PostScript

Specifications in chart are based on information as of 11/93. *Estimated dealer price including manufacturer's rebate is under $1400. Dealer prices may vary. † At 4% coverage. ‡Rebate applies to PS23 model. microLaser and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. LaserJet is a registered trademark of Hewlett-Packard, Inc. Mac is a registered trademark of Apple Computer, Inc. © 1993 TI.

THE UNDER $1400 PRINTER, REDEFINED.

If you're looking for a true 600 dpi printer with a street price under $1400, you'll have a tough time beating the new TI microLaser Pro 600.

You see, when we set out to design the ideal office printer, we began by asking thousands of users what they wanted most. And then, instead of making those "key care-abouts" optional, we made them standard.

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	TI microLaser Pro 600	Apple LW Pro 600	HP LaserJet 4M
True 600 dpi	*Yes*	*Yes*	*Yes*
Speed/Processor	*8 ppm/RISC*	*8 ppm/68030*	*8 ppm/RISC*
Emulations	*PCL5/ Adobe® PostScript 2*	*PCL4/ Adobe PostScript 2*	*PCL5E/ Adobe PostScript 2*
Compatibility	*Mac/DOS*	*Mac/DOS*	*Mac/DOS*
Toner Cart. Life	*15K pages†*	*6K pages*	*6K pages*
Paper Trays	*250 sheet/ 250 sheet*	*250 sheet/ 100 sheet*	*250 sheet/ 100 sheet*
Auto Language Switching	*Yes*	*No*	*Yes*
Auto Interface Switching	*Yes*	*Yes*	*Yes*
40MHz Processor Upgrade	*Optional*	*Not Avail.*	*Not Avail.*
List Price	*$1599**	*$2099*	*$2479*

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differences make them harder to use. For instance, in PageMaker, pressing the Command key and clicking on the No Style entry in the Styles palette brings up a style-editing dialog box. To define styles that easily in QuarkXPress, you need to buy the Xstyle XTension, from Em Software ($99). PageMaker also lets you change styles globally while retaining local styling (italics within a paragraph, for example). With QuarkXPress, you must manually re-create the italics.

Tags

ADVANTAGE: QUARKXPRESS

Tagging allows you to apply styles by embedding commands enclosed in carets in text that is to be imported into layout software. The layout software interprets the careted commands instead of displaying them on-screen or printing them, thus styling text on the fly. For instance, placing the tag <i> before and after a word causes it to appear in italics when it's imported into QuarkXPress.

Although PageMaker outshines QuarkXPress in most text-handling functions, it lags behind in tagging. PageMaker's tags can convey only paragraph styles. QuarkXPress' tags can specify text and paragraph specifications and can even apply to words or sentences in the middle of a paragraph.

Once you've learned how to use it, QuarkXPress' tagging language provides a good deal of the functionality of a traditional code-based typesetting front end. The language isn't well documented, however. The easiest way to learn the tagging language is to style some text in QuarkXPress and print it out, then export the text with tags to a word-processing program and print it out again (the result will be a document that includes both the text and the uninterpreted commands), and then compare the exported text with the printed output.

Scripts

ADVANTAGE: NEITHER

Scripts automate program functions, ensure that documents of the same kind are produced to a uniform standard, and enable you to run jobs without sitting in front of your computer. PageMaker has its own scripting language, through which you can control all mouse and keyboard functions. (This excludes commands available only in the Story Editor, unfortunately, which means that PageMaker's search-and-replace functions are not available through scripting.) For more-powerful scripts, you need to use an application such as AppleScript or UserLand's Frontier. PageMaker supports only a limited set of Apple events, however, so you won't be able to harness the full power of an external scripting language.

QuarkXPress doesn't have a native scripting language. It does, however, support more Apple events than PageMaker does, so you can use AppleScript to create more-complex and more-varied scripts than are possible with PageMaker.

On balance, PageMaker's scripts are more useful — they're relatively easy to write (send for Aldus' free scripting guide for complete instructions and useful examples), and the only thing you need in order to write them is a text editor or PageMaker itself. QuarkXPress' scripting capabilities are more appropriate for developers and others who are willing to take the time to master a complex language.

Extending Functionality

ADVANTAGE: QUARKXPRESS

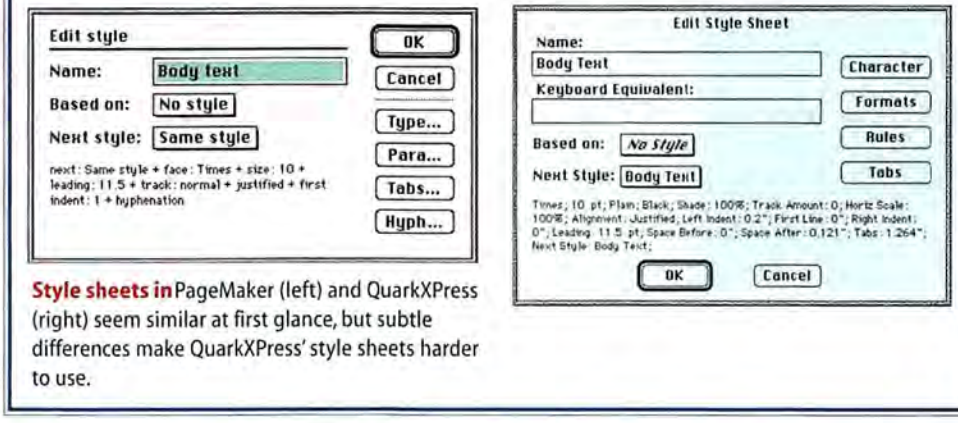
Both of the programs support extra features through software add-ons — some are included with the products, and others must be purchased from third parties. The EfiColor color-management XTension for QuarkXPress is one of the best known of these add-ons. The most interesting PageMaker add-on is the Expert Kerning Addition. But many of PageMaker 5's Additions perform fundamental tasks that are built in to QuarkXPress.

The most powerful add-ons come from third-party developers. Some of these products customize the layout programs for a particular purpose. For instance, Sonar Bookends, from Virginia Systems, enables QuarkXPress and PageMaker to generate professional-level indexes and tables of contents. Other add-ons refine built-in functions — Scitex Grids & Guides (for QuarkXPress) and Zephyr Grids (for PageMaker), for example, automate and extend the usefulness of built-in guides.

Quark pioneered add-on software, and QuarkXPress now has more than 200 powerful third-party XTensions available for a wide range of prices. For instance, Ad Director, an XTension for advertising-production management from

figure 3

Style Sheets / alike but different



Style sheets in PageMaker (left) and QuarkXPress (right) seem similar at first glance, but subtle differences make QuarkXPress' style sheets harder to use.

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Managing Editor Software, costs $7,995; the seven XTension packages from Scitex, which include Document Reports, Fractions, and Grids & Guides, range from $69 to $199. The mail-order clearinghouse XChange (800-788-7557 or 303-229-0620) distributes most of the XTensions available for QuarkXPress.

Aldus added support for Additions in PageMaker 4.2, and we're just beginning to get powerful third-party Additions. Zephyr Software has developed several useful tools, including CleanSweep ($49), for automatically converting older documents to version 5.0 format, and DisBatch ($99.95), which scours your hard disk for documents that can be saved in a more compact format. A more specialized product, Tableau ($695), from Publishing Revenue Partners, manages classified ads. The Aldus Developer Cooperative (800-685-3547) distributes PageMaker Additions.

PostScript Printing

ADVANTAGE: PAGEMAKER

A page-layout program needs greater control over output than do most other applications. In the past, this meant PageMaker used its own printer driver, Aldus Prep. QuarkXPress used the standard LaserWriter driver, with the addition of custom printing routines. Both programs now work with the same driver — LaserWriter 8.0, a new PostScript Level 2 driver developed by Apple and Adobe Systems (Adobe calls its version of the driver PS Printer).

Only PageMaker, however, uses — and ships with — LaserWriter 8.0 PPD (PostScript Printer Description) files necessary for printing. QuarkXPress still uses its own PDFs (Printer Description Files) to customize output for specific devices. Quark says QuarkXPress will soon support PDFs as well as PPDs.

Customer Service

ADVANTAGE: PAGEMAKER

Aldus and Quark each offer 90 days of free technical support, but with considerable differences: Aldus' support begins with your first phone call, no matter when that is. Once the 90 days have elapsed, you can subscribe to a paid support plan or use a pay-as-you-go 900 number. Aldus tech-support representatives seem to have a certain amount of latitude in deciding whether to talk to a user who is not covered by a service plan.

Quark's free support begins when you purchase your copy of QuarkXPress; when your 90 days are up, you must subscribe to an extended support plan to use the support line. Quark is extremely strict about this — there is no grace period, and tech-support representatives cannot override service expirations.

Each company also has an on-line presence — you get official advice from company representatives as well as tips from other users — and availing yourself of it is often the most satisfactory way to solve problems. Aldus has a full-time support forum on CompuServe and is also active on America Online. Quark is active on both America Online and in CompuServe's DTP Forum. These services carry no fees other than connection-time charges.

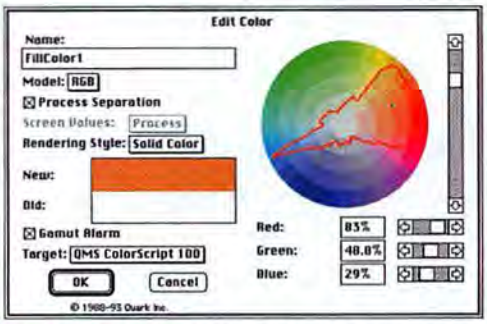
Quark and Aldus both fared well in our tech-support tests. We called each company three times and asked a different question each time. It took awhile to reach representatives — about 10 minutes on average at Quark and 20 minutes at Aldus — but once connected, they answered our questions correctly and efficiently.

And the Winner Is . . .

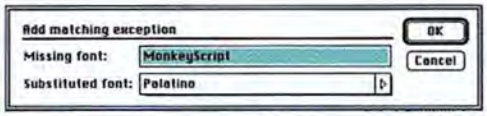
If you're concerned about ease of use — if you work with people new to desktop publishing or if a lot of people who are not full-time designers will use the program — then go with PageMaker. Likewise, if you want the best available typography, choose PageMaker.

figure 4

Special Features



QuarkXPress supports the EfiColor color-management system, which uses device profiles (descriptions of the colors you can get from a specific device) to ensure the best possible color match between on-screen images and final output.



PageMaker offers superior font management. You can use PANOSE or SuperATM font substitution, and you can make substitutions permanent or temporary.

QuarkXPress is the better program for those who need automated, high-end production features. If you work with color processing regularly, you may appreciate QuarkXPress' trapping ability and the edge the EfiColor system offers for color management. In addition, QuarkXPress' numerous third-party XTensions enable you to easily add specialized features that aren't included in the program. The XTensions aren't cheap, but at least they're an option.

If both programs sound too complex and costly, consider a less expensive program such as Ready,Set,Go!. On the other hand, those who work with long documents, book manuscripts, or technical publications should check out FrameMaker. In today's competitive market, one thing is certain: All these page-layout programs are improving rapidly.

Kathleen Tinkel is editor and publisher of the newsletter *MacPrePress*. She specializes in prepress, graphic design, and typography.

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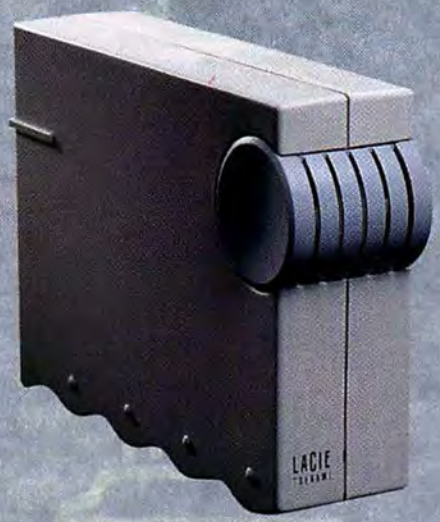

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Low-Cost Color SCANNERS

THINK BACK IN TIME: You used to associate color scanning with service bureaus and professional graphic designers — too expensive and too complicated for the average Mac user. But color flatbed scanners are becoming more appealing — both in price and in capabilities. Each of the ten scanners we evaluated for this report sells for less than $2,000; in fact, a couple of them will set you back less than a grand.

By Bruce Fraser and Anita Epler

A flatbed scanner is no substitute for the costly slide scanners and more costly drum scanners used in high-end publishing. But the flatbed models we tested are capable of scanning decent color images for on-screen display or FPO (for position only) use in layouts, and our research shows that many folks who buy color scanners use them with gray-scale images, line art, and OCR (optical character recognition) more than they do with color images.

Pleasant Surprise

When we last looked at low-cost color flatbed scanners, we found them severely lacking, particularly in the software department (see "Getting the Picture: Color Flatbed Scanners," May '93, page 106). We're pleased to note that bundled software has been improved and that it now gives you the tools that are necessary for obtaining quality scans.

In addition to testing the latest batch of low-cost color flatbed scanners for image quality and speed, we examined each scanner's documentation for clear instructions and evaluated each company's technical support. The Apple Color OneScanner and the La Cie Silverscanner II were the clear winners for documentation: Each comes with a quick-start guide in addition to a well-illustrated, high-quality manual containing excellent setup instructions. The Apple scanner also includes a useful booklet entitled *Basics of Color Design.* None of the scanners has cryptic or unacceptable documentation.

Most of the scanners were easy to set up. The AVR 6600 lost points, because its SCSI-ID selector is on the bottom of the scanner and uses DIP switches. The XRS OmniMedia 12C's SCSI-ID selector is also on the bottom of the unit, but this scanner's push wheel is much easier to set than DIP switches. All the other scanners have easily accessible push-wheel or rotary-switch SCSI-ID selectors.

Need More Than Speed

If you need to scan a lot of images on a tight deadline, scanning speed is definitely an issue. We tested the raw speed of the hardware by scanning a 4-x-5-inch photograph in 24-bit color at 300 dpi. But you also need to take into account the quality of the original image and how much time you'll need for saving and editing the image once you've scanned it. For example, the Apple Color OneScanner has the fastest engine, but its accompanying software, Ofoto, took more than five minutes to save our test image. The other scanners, each using a Photoshop plug-in, saved the same file in less than a minute. The AVR 6600 had the fastest results in our test, but it also yielded poor image quality. The Mirror 800 Pro and the La Cie Silverscanner II turned in some of the slowest times but produced the best image quality.

Although the Silverscanner's hardware may not be fast, its plug-in is loaded with features for increasing your productivity. Keyboard command equivalents invoke both the preview and the full scan, and unlike most other scanners, the Silverscanner doesn't have to complete the preview before you start the final scan. Likewise, you can reset the cropping marquee without waiting for the scan head to finish its travel. You can also move the selection marquee without changing its size — particularly useful for making quick scans of several same-sized originals.

The Bottom Line

GOOD NEWS: COLOR FLATBED SCANNERS HAVE IMPROVED since we last looked at them. We evaluated each scanner based on overall performance and price. Customer service is important, especially if you're new to color scanners: We compared technical support, length of warranty, and money-back guarantee. We also considered image quality — based on gray-scale-, line-art-, and color-image tests — and evaluated the software bundled with each scanner. Two choices stand out from the pack.

⊕ = OUTSTANDING
● = ACCEPTABLE
⊖ = POOR

	PRICE/ PERFORMANCE	CUSTOMER SERVICE	IMAGE QUALITY	SOFTWARE
★★★★ La Cie Silverscanner II	●	⊕	⊕	⊕

The best all-around scanner we tested was the La Cie Silverscanner II ($1,599 direct). This scanner comes with an excellent Photoshop plug-in that's filled with productivity-enhancing features and was among the top performers in most of our speed and image-quality tests.

★★★½ Apple Color OneScanner	⊕	⊕	●	●

One of the most inexpensive and easy-to-use scanners we tested was the Apple Color OneScanner ($1,199 list, $990 street). This scanner is meant for novices — documentation is thorough, and the software, Light Source's Ofoto, is designed to make scanning as automatic as possible. But be aware that you do sacrifice some performance for ease of use.

★★★½ Epson ES-800C Pro	●	●	⊕	⊕
★★★ Epson ActionScanning System	●	●	●	⊕
★★★ Focus FocusScan 800	●	⊕	⊖	●
★★★ Mirror 600 Pro	●	●	●	●
★★★ Mirror 800 Pro	●	●	●	●
★★★ Tamarack 12000C	⊖	●	●	●
★★★ XRS OmniMedia 12C	●	⊖	●	●
★★½ AVR 6600	●	●	⊖	⊖

Listing is alphabetical within groups of equal mouse ratings.

figure 1

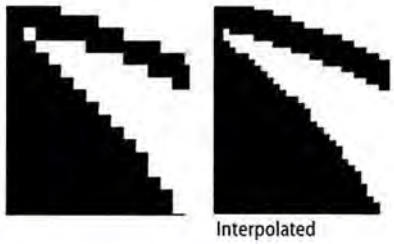
Image Quality / seeing is believing

MacUser Labs **We tested ten** low-cost color flatbed scanners for gray-scale-, line-art-, and color-image quality.

Line-Art-Image Quality

Interpolated

Good: The Epson ES-800C Pro gave the best line-art-image quality. Notice how well Epson's interpolation algorithm smoothed out the jaggies.



Interpolated

Jaggy: The Mirror 600 Pro produced the least-resolved image quality. Despite software resolution enhancement, the jagged edges are quite noticeable.

Color-Image Quality

Good: The Mirror 800 Pro reproduced our color image the most accurately, capturing the saturated colors and reproducing the background gradient without banding.

Fuzzy: When we printed our RGB test file from Photoshop, the Apple Color OneScanner's Ofoto software caused banding and posterization. This was solved by exporting the image in CMYK mode.

Another Gray Area

If you're scanning black-and-white photos or other gray-scale images, you want a scanner that is able to discern as many shades of gray as possible. To evaluate each scanner's gray-scale performance, we scanned a Kodak SR-37 gray-scale target, which contains 37 gray swatches of increasing optical density. The Apple Color OneScanner, the Epson scanners, and the La Cie Silverscanner II were each able to capture 30 or more shades of gray. The XRS OmniMedia 12C and the Mirror scanners performed poorly, but the AVR 6600 turned in by far the worst results, barely discerning 18 of the 37 shades of gray.

If you scan many images and the colors in your scanned images exhibit a lot of variability due to fluctuations in the scanner's light source, you're not likely to be happy. To evaluate light-source stability, we made two identical scans ten minutes apart on each scanner. Then we subtracted the results of the first scan from the second, using Photoshop's Subtract command — ideally, the result should be a solid black image.

The La Cie Silverscanner II and the Focus FocusScan 800 showed the least variability, exhibiting very little *noise* (extraneous or missing information) or lamp fluctuation. The Apple Color OneScanner showed the greatest difference between the two scans — one scan was considerably darker than the other. It was difficult to tell if the problem was due to the scanner engine or to Ofoto's automatic features.

Sharp as a Tack

If you scan line-art images, pay particular attention to a scanner's resolution — both optical and interpolated. The optical resolution is the base resolution of the scanner's engine; the interpolated resolution is the increased resolution achieved with special software algorithms. To test each scanner's ability with line art, we ran two tests, one scanning a test image at the stated optical resolution of each scanner and the other using the interpolated resolution.

To get the best results, you have to experiment with a scanner's resolution settings. A *threshold-setting* feature, which allows you to specify when a pixel is defined as black or white (to help your scanner pick up fine lines it might otherwise miss), makes adjustments easier. Without threshold settings, you have to experiment with the brightness and contrast controls, which serves the same purpose but takes far longer. Only one scanner — the AVR 6600 — includes a threshold-setting feature in its software; unfortunately, it's poorly implemented.

The best line-art image was from the Epson ES-800C Pro, at a 1,600-dpi interpolated resolution. The Apple Color OneScanner and the La Cie Silverscanner II tied for the runner-up position, at

their top interpolated settings of 1,200 dpi and 1,600 dpi, respectively. The Tamarack 12000C, despite an optical resolution of 1,200 x 600 dpi, barely beat our last-place finisher, the 600-x-300-dpi Mirror 600 Pro, which had the least resolved image overall.

Is Image Everything?

If you plan to do color work with your scanner, look for one that offers color accuracy and produces images that are clear and do not suffer from artifacts (color blips and other marks introduced by the scanner) and posterization (bands or jumps instead of smooth color gradients). Our test images present a challenge even to much more expensive and powerful scanners: Our jury of color experts thought that none of these inexpensive flatbed scanners did a great job. We focused on which ones produced the best image quality, despite their limitations.

The Mirror 800 Pro led the pack in color-image quality, followed by the XRS OmniMedia 12C and the La Cie Silverscanner II. The AVR 6600 and the Focus FocusScan 800 tied for last place: Their images had vertical streaks and poor color balance.

Testing the Apple Color OneScanner presented some problems. When we attempted to use Ofoto's color-adaptive-calibration process to calibrate the images to the Tektronix Phaser IIsdx dye-sublimation printer (see the "Scanning Software" sidebar), we obtained results that could be characterized as lurid and weird, with strong posterization in the highlights and strange psychedelic rainbows in the graduated background of our building-blocks image. After consulting with Light Source, Ofoto's publisher, we came to the conclusion that our test image and the Tektronix printer combined were simply too much for Ofoto to handle. The software matched

How We Tested / color flatbed scanners

AT ZD LABS, WE BEGAN OUR EVALUATION the same way a customer would — we unpacked each scanner, making note of any stabilization hardware and environmentally sound packaging. We then rated documentation, installation of the scanner and its accompanying software, basic warranty coverage, and overall ease of use.

We connected each scanner to a Mac IIci with an 80-megabyte hard drive and 32 megabytes of RAM. For on-screen display, we used a calibrated SuperMatch 20•T Multimode Trinitron color monitor connected to the Mac via a SuperMac Thunder/24 video card.

We tested the gray-scale sensitivity of each scanner by using a Kodak SR-37 gray-scale target, which comprises gray swatches of increasing optical density. We looked at the resulting scans for a scanner's susceptibility to color shifting. A *color cast*, which is constant across the range from light to dark, is easy to correct, but a *color shift*, in which a scanner overemphasizes one color in the highlights and a different color in the shadows, is more difficult to correct.

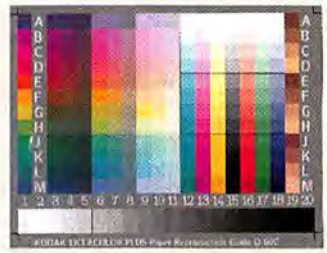
Resolution is critical to line art. We used Century A&P's PM-189 Scanner Test Target to determine line-art resolution. This target consists of wedges of converging lines and progressively smaller line pairs. We also scanned another line-art graphic to test each scanner's interpolation algorithm.

We tested color-image quality by scanning two color photographs — one showing highly saturated solid colors with a gradient background and another containing a variety of skin tones. We then printed these scanned images to a Tektronix Phaser IIsdx dye-sublimation printer and had a jury of color experts evaluate the results.

To examine OCR capabilities, we evaluated each scanner's speed and accuracy at scanning a single-page, 10-point-Courier document, using Caere's OmniPage Professional OCR software. We also scanned a Kodak Q-60 color target. / Anita Epler

Test Documents

Color Building Blocks
The areas of shadow, saturated color, and gradient background of our test image challenged each scanner's ability to accurately capture saturated colors without affecting the shadow areas.



Color Range
We scanned this industry-standard Kodak Q-60 color target to plot each scanner's color range.

High-Resolution Line Art
We scanned this graphic at both optical and interpolated resolution to test the quality of each scanner's interpolation algorithm.

Scanning Software / third-party alternatives

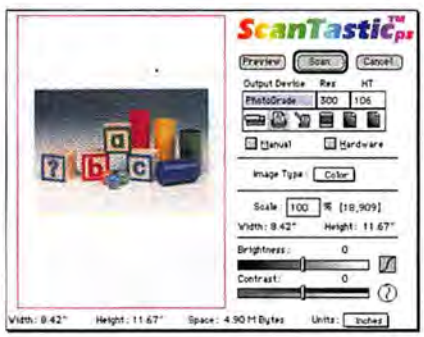
IN THE PAST, THERE WASN'T MUCH YOU COULD DO if you bought a scanner and didn't like the software that came with it. Now you have some alternatives. ZD Labs looked at two of them for this report: Light Source's Ofoto 2.0 and ScanTastic, from Second Glance.

Designed with novices in mind, Ofoto 2.0 has many automatic features. Ofoto is perhaps best known for its Autofind and Autostraighten features, although we had trouble with images that had light-colored backgrounds. Speed is a major problem for Ofoto — saving and printing a file in this application took substantially longer than in Photoshop. Changing the default settings can also be complicated.

We also uncovered an anomaly during the course of our testing: When we scanned a test image, using Ofoto's color-adaptive-calibration process, the results contained artifacts and posterization. After many hours with Light Source engineers, we found a partial solution: Ofoto needs to color-correct *and* output the pages from within the program itself; if you need to edit the image outside of Ofoto, you must export it as a CMYK TIFF file. This unconventional approach is complicated by a lack of documentation, aside from a cursory mention deep within the manual that images should be exported in CMYK format whenever possible.

The ScanTastic Photoshop plug-in made it simple for us to generate high-quality scans directly from within Photoshop, using either the no-fuss automatic defaults or some easily implemented custom settings. Second Glance offers ScanTastic for four of the most popular scanner brands on the market, from Apple, Epson, Hewlett-Packard, and UMAX. The one drawback of ScanTastic is its lack of software resolution enhancement.

If you're unhappy with your scanning software, now you've got some choices. Ofoto offers built-in software interpolation, simple automatic color correction, and the bells and whistles of Autofind and Autostraighten, and ScanTastic is an affordable, intuitive Photoshop plug-in. / Anita Epler



ScanTastic provides intuitive operator override of its automatic settings. One main screen covers all the user options, so you don't have to dig for a lot of hidden palettes and dialog boxes.

Ofoto

LIST PRICE: $395.
STREET PRICE: $275.
PROS: Simple and easy to use. Color-adaptive color correction.
CONS: Expensive. Has difficulty with some images. Slow. Is not a Photoshop plug-in.
COMPANY: Light Source, Larkspur, CA; 800-231-7226 or 415-461-8000.

ScanTastic

LIST PRICE: $99 (direct).
PROS: Inexpensive. Intuitive interface. Is a Photoshop plug-in.
CONS: Doesn't work with all scanner brands.
COMPANY: Second Glance, Laguna Hills, CA; 714-855-2331.

most of the colors in the image more closely than any of the ten scanners' uncalibrated scans, but where it couldn't create a match, it broke down completely. With a less challenging image or with a printer with a narrower color gamut, we suspect Ofoto would perform much better than this test indicates. Clearly, though, Ofoto's color-matching has limits; in this test, we ran into them head-on.

Hooked on Text

A good scanner with reliable OCR software can save you hours of inputting documents manually — but only if the results are quick and accurate. We used Caere's OmniPage Professional, a Bottom Line pick in last year's roundup of OCR software (see "Can You Read This? OCR Software," January '93, page 152) to scan and recognize a page of text set in 10-point Courier. We timed how quickly each scanner read the page and then counted the number of errors. The La Cie Silverscanner II, the Tamarack 12000C, and the XRS OmniMedia 12C produced the fewest errors; the OmniMedia 12C was also the fastest in this test. The Apple Color OneScanner took the

Apple Color OneScanner

RATING: ♦♦♦½
LIST PRICE: $1,199.
STREET PRICE: $990.
PROS: Excellent documentation. Inexpensive. Ofoto software is easy to use.
CONS: No Photoshop plug-in.
ENGINE: Tokyo Electric Co.
MAX. SCAN AREA: 8.5 x 14 in.
OPTICAL RESOLUTION: 300 x 300 dpi.
INTERPOLATED RESOLUTION: 1,200 x 1,200 dpi.
WARRANTY: 1 year.
COMPANY: Apple Computer, Inc., Cupertino, CA; 800-538-9696 or 408-996-1010.

AVR 6600

RATING: ♦♦½
LIST PRICE: $1,125 without software (direct); $1,300 with Photoshop 2.5.
PROS: Fast.
CONS: Poor color- and gray-scale-image quality. DIP-switch SCSI-ID selector located on bottom of scanner. Poor OCR performance.
ENGINE: AVR.
MAX. SCAN AREA: 8.5 x 14 in.
OPTICAL RESOLUTION: 600 x 300 dpi.
INTERPOLATED RESOLUTION: 1,600 x 1,600 dpi.
WARRANTY: 2 years.
COMPANY: AVR Technology, San Jose, CA; 800-544-6243 or 408-434-1115; 408-434-0968 (fax).

figure 2

Low-Cost Color Flatbed Scanners / getting better all the time

Before you spend $1,000 or more replacing your old scanner, make sure you'll get everything you need with the new one. Keep in mind how you're going to use the scanner as you check out the list of features below. And of course, take price into account.

	✓ Apple Color OneScanner	AVR 6600	Epson ActionScanning System	Epson ES-800C Pro	Focus FocusScan 800	✓ La Cie Silverscanner II	Mirror 600 Pro
Can crop in preview	●	●	●	●	●	●	●
Software has brightness/contrast controls	●	●	●	●	●	●	●
Software has threshold controls		● (B & W only)					
Cables included		●	●	●	●	●	●
Sheet-feeder option (cost)		● ($470)	● ($599)	● ($599)		● ($699)	
FCC Class B-certified	●		●	●	●	●	●
OCR software included		●				●	●

✓ MacUser RECOMMENDS

longest to finish the scan but produced relatively few errors. The Epson ActionScanning System and the AVR 6600 were by far the most error-prone.

You Make the Call

When you buy a scanner, you're also buying in to a company. Plunking down a grand or more should guarantee you some help in getting the scanner up and running and in trouble-shooting problems. We called each of the scanner manufacturers, posing as real users with real problems, to see how well they'll serve you. We're happy to report that the level of technical support has improved substantially since our last evaluation. Only one company — XRS — did poorly.

If you're looking for an inexpensive color scanner,

Epson ActionScanning System

RATING: ♦♦♦

LIST PRICE: $999.

STREET PRICE: $900.

PROS: Switchable internal termination. Inexpensive. Uses ScanTastic Photoshop plug-in.

CONS: Poor OCR performance.

ENGINE: Epson.

MAX. SCAN AREA: 8.5 x 11.7 in.

OPTICAL RESOLUTION: 300 x 300 dpi.

INTERPOLATED RESOLUTION: 1,200 x 1,200 dpi.

WARRANTY: 1 year.

COMPANY: Epson America, Inc., Torrance, CA; 800-922-8911 or 310-782-0770.

Epson ES-800C Pro

RATING: ♦♦♦½

LIST PRICE: $1,649.

STREET PRICE: $1,300.

PROS: Excellent line-art-image quality. Good gray-scale-image quality. Uses ScanTastic Photoshop plug-in.

ENGINE: Epson.

MAX. SCAN AREA: 8.5 x 11.7 in.

OPTICAL RESOLUTION: 400 x 400 dpi.

INTERPOLATED RESOLUTION: 1,600 x 1,600 dpi.

WARRANTY: 1 year.

COMPANY: Epson America, Inc., Torrance, CA; 800-922-8911 or 310-782-0770.

Focus FocusScan 800

RATING: ♦♦♦

LIST PRICE: $1,099 (direct) without software; $1,299 with Photoshop 2.5.

PROS: Three-year warranty.

CONS: Poor color-image quality.

ENGINE: Epson.

MAX. SCAN AREA: 8.5 x 11.69 in.

OPTICAL RESOLUTION: 800 x 400 dpi.

INTERPOLATED RESOLUTION: 800 x 800 dpi.

WARRANTY: 3 years.

COMPANY: Focus Enhancements, Woburn, MA; 800-538-8866 or 617-938-8088.

La Cie Silverscanner II

RATING: ♦♦♦♦

LIST PRICE: $1,599 (direct) with Color It! image-editing software; $1,999 with Photoshop 2.5.

PROS: Excellent documentation. Excellent software. Good image quality.

ENGINE: Epson.

MAX. SCAN AREA: 8.32 x 11.68 in.

OPTICAL RESOLUTION: 800 x 400 dpi.

INTERPOLATED RESOLUTION: 1,600 x 1,600 dpi.

WARRANTY: 1 year.

COMPANY: La Cie Ltd., Beaverton, OR; 800-999-0143 or 503-520-9000; 503-520-9100 (fax).

Mirror 800 Pro	Tamarack 12000C	XRS OmniMedia 12C
●	●	●
●	●	●
●	●	●
●	●	
●		

Trends / scanning improves its image

SCANNING WILL BECOME LESS OF A HASSLE with the advent of a new image-acquisition standard and new color-management technology.

Scan directly into your applications. Hewlett-Packard has developed an image-acquisition standard called TWAIN that allows you to use a TWAIN-compliant scanner to scan directly into TWAIN-compliant applications. Adobe and Aldus already support the standard, with Photoshop 2.5 and PageMaker 5.0, respectively, and other major application vendors are expected to follow suit, as are most scanner vendors. In the early stages, at least, TWAIN is likely to be most useful for scanning gray-scale images and line art — color images typically require more postscan tweaking than applications such as PageMaker allow.

WYSIWYG scanning gets real. Anyone who has worked with desktop color knows that the colors you scan aren't necessarily the ones you see on-screen or get from the printer. However, color-management technologies are rapidly maturing. The buzzword is profiles: Savitar's ScanMatch 2.0 creates ColorSync profiles, EFI's new EfiColor Works contains tools for creating EfiColor scanner profiles, and Agfa's FotoTune creates scanner profiles for Agfa's FotoFlow color-management system. By allowing users to create and update their own profiles, these new color-management systems will get the most-accurate results from the scanner, resulting in better, more-predictable color. / Bruce Fraser

now may be the time to acquire one. The La Cie Silverscanner II is the clear overall winner, with good all-around performance and exceptional software. The Apple Color OneScanner was designed with novices in mind. The scanner itself has a fairly unremarkable 300-dpi engine: The accompanying Ofoto software is the deciding factor. If the prospect of automatic, albeit slow, scanning appeals to you, the Color OneScanner with Ofoto is an outstanding value for the money. Just be aware of the limitations we encountered in our testing.

Bruce Fraser is a *MacUser* contributing editor. Coauthor Anita Epler, a ZD Labs project leader, managed the testing for this report, with assistance from lead technician Fred DeLisio.

Mirror 600 Pro

RATING: ♦♦♦
LIST PRICE: $1,399 (direct).
CONS: Worst line-art-image quality. Undistinguished performance.
ENGINE: Tamarack.
MAX. SCAN AREA: 8.5 x 11.7 in.
OPTICAL RESOLUTION: 600 x 300 dpi.
INTERPOLATED RESOLUTION: 600 x 600 dpi.
WARRANTY: 1 year.
COMPANY: Mirror Technologies, Inc., St. Paul, MN; 800-654-5294 or 612-633-4450; 612-633-3136 (fax).

Mirror 800 Pro

RATING: ♦♦♦
LIST PRICE: $1,599 (direct).
PROS: Excellent color-image quality. Good all-around scanner.
CONS: Slow.
ENGINE: Tamarack.
MAX. SCAN AREA: 8.5 x 11.7 in.
OPTICAL RESOLUTION: 800 x'400 dpi.
INTERPOLATED RESOLUTION: 800 x 800 dpi.
WARRANTY: 1 year.
COMPANY: Mirror Technologies, Inc., St. Paul, MN; 800-654-5294 or 612-633-4450; 612-633-3136 (fax).

Tamarack 12000C

RATING: ♦♦♦
LIST PRICE: $1,995.
STREET PRICE: $1,890.
PROS: Good OCR performance.
CONS: Expensive. Poor line-art-image quality.
ENGINE: Tamarack.
MAX. SCAN AREA: 8.5 x 11.7 in.
OPTICAL RESOLUTION: 1,200 x 600 dpi.
INTERPOLATED RESOLUTION: 2,400 x 2,400 dpi.
WARRANTY: 1 year.
COMPANY: Tamarack Technologies, Inc., Milpitas, CA; 800-643-0666 or 408-956-0144; 408-956-1552 (fax).

XRS OmniMedia 12C

RATING: ♦♦♦
LIST PRICE: $1,895 (direct) with Photoshop 2.5LE; $2,295 with Photoshop 2.5.
PROS: Good color-image quality. Can scan transparencies. Fastest OCR scanning.
CONS: Expensive. SCSI-ID selector located on bottom of scanner.
ENGINE: Microtek.
MAX. SCAN AREA: 8.5 x 13.5 in.
OPTICAL RESOLUTION: 600 x 300 dpi.
INTERPOLATED RESOLUTION: 1,200 x 1,200 dpi.
WARRANTY: 1 year.
COMPANY: XRS Scanner Corp., Torrance, CA; 310-214-1900; 310-214-1474 (fax).

The new HP DeskWriter 310 *printer.*

Desk

*Suggested U.S. list price. †In Canada call 1-800-387-3867, Ext. 7857. ©1993 Hewlett-Packard Company PE12523

optional.

Print high-quality black & white or color wherever you want to work.

Hewlett-Packard is proud to present the DeskWriter printer that doesn't require a desk. The HP DeskWriter 310 is small and light enough to let you print anywhere. At the office, at home or on the road. And it gives you sharp, 300-dpi print quality, in black & white or color.

The HP DeskWriter 310 costs only $379,* yet it comes loaded with 35 scalable fonts, along with a new lightweight, multi-voltage power adapter. It prints portrait and landscape on plain paper, transparencies or labels, and it uses HP's own inkjet technology for clear, crisp output at up to three pages per minute.

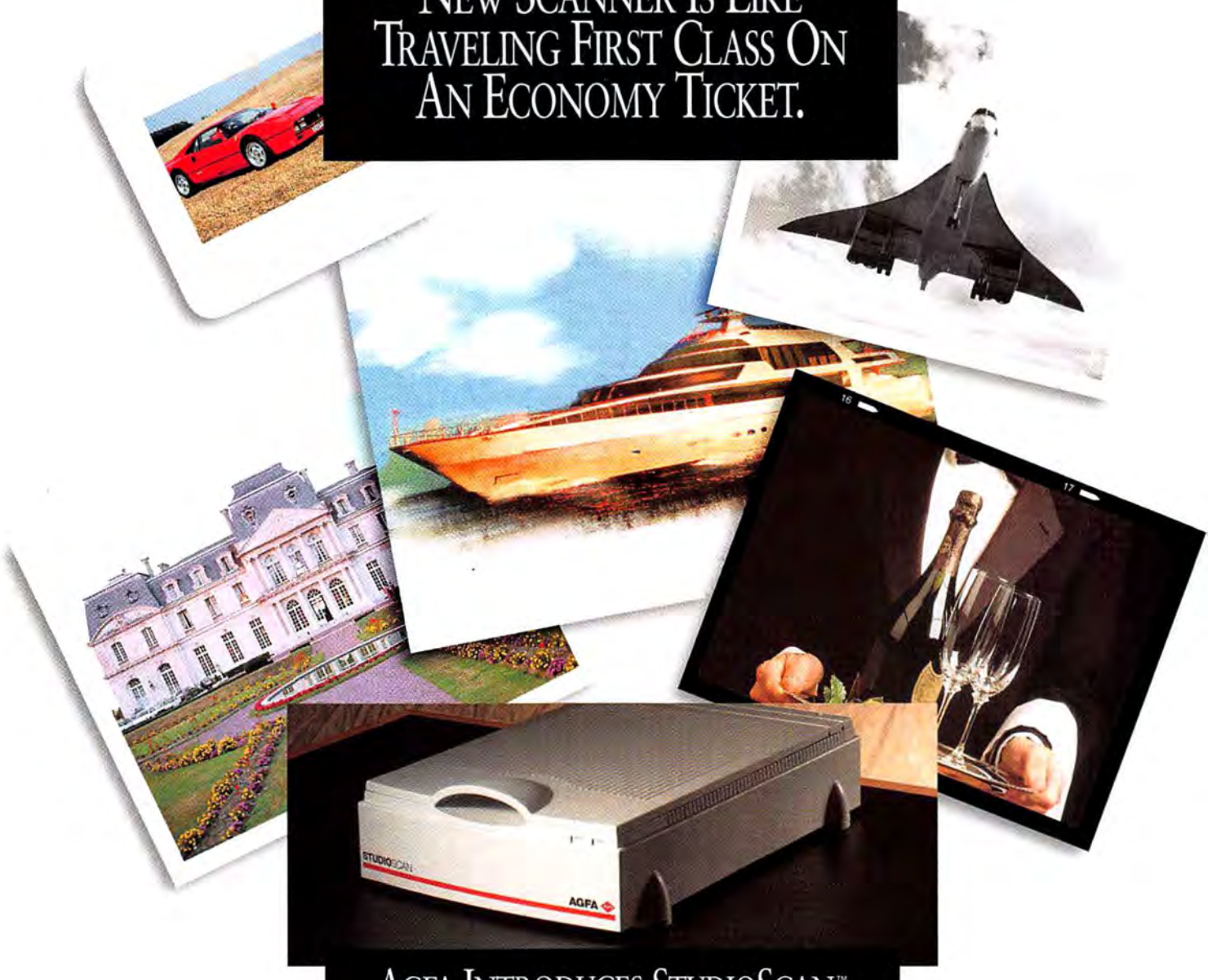
If that's not enough for you, a whole family of optional accessories is available, including a color kit for just $49, and a multi-page sheet feeder for easier desktop printing.

HP has managed to fit everything you could want into a little printer package. To see for yourself, look in the Yellow Pages, or call 1-800-552-8500, Ext. 7857 for the name of the HP dealer nearest you.

DeskJet Printers Make it happen.

HEWLETT® PACKARD

Buying Our New Scanner Is Like Traveling First Class On An Economy Ticket.



Agfa Introduces StudioScan.™ So Much Scanner For So Little Money.

It used to be that unless you had a lot of money to spend, a scanner was simply out of the picture. But now there's Agfa StudioScan, the new feature-rich scanner that's wonderfully affordable.

StudioScan offers the speed and efficiency of one-pass scanning for both black-and-white and color images. Its flatbed design accommodates sizes up to 8.5″ x 14″, and an optional transparency module scans 35mm slides up to 8″ x 10″.

What's more, StudioScan comes with a complete software package, including Agfa's proven labor-saving FotoLook,™ FotoTune LE,™ FotoSnap™ programs, and Adobe PhotoShop LE. Compatible with both Macintosh and PC systems, StudioScan actually guides an entry-level user through the entire scanning process.

To find out more about StudioScan's high-quality imaging for your layouts, in-house publications, illustrated reports, and more, call 1-800-685-4271 today. And discover the Agfa scanner that offers first-class features at an economy price.

AGFA Agfa

The complete picture.

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CIRCLE **52** ON READER SERVICE CARD

INSPECTOR GENERAL /

ALDUS FREEHAND 4.0 MARCHES ON ILLUSTRATOR

ALDUS FREEHAND 4.0 IS ON THE MOVE. This latest version steals back ground from Adobe Illustrator 5.0 and stakes new territory in type handling and page-layout flexibility.

FreeHand's text handling rivals that of page-layout sibling PageMaker 5.0 by offering precise kerning, hanging indents, baseline shift, and copy fitting. A text-block ruler makes formatting text easier and lets you set up tables quickly.

The vastly improved interface sports new floating palettes, including the Inspector, which serves as the command center for your illustration. Borrowed from the NeXT illustration program Virtuoso, the Inspector is a master palette that lets you control all graphic, type, color, and layout functions, dramatically reducing trips to the menu bar. You can type text directly into a document rather than enter it in a dialog box, and you can drag and drop color from the color selector onto any object. You'll find yourself concentrating more on design and a lot less on maneuvering through the program (Aldus claims it eliminated 40 dialog boxes).

FreeHand 4.0 has much of Illustrator 5.0's pathfinder capability, letting you combine or subtract object shapes with one command. It lets you import and export Illustrator files and now even opens its own EPS files. 206-622-5500. $595; upgrade, $150. / Sean Safreed

FAIRY DUST AND NEON /

PIXAR'S TYPE ARTISTRY

SOMETIMES PLAIN OLD TYPE looks too, well, flat. Enter Typestry, Pixar's tool for creating 3-D type. Typestry 2.0 has a slew of new special effects such as particles, tubes, and rubber sheets as well as several interface enhancements. Many of the new features are geared to multimedia but can easily be adapted for print.

Particle generators let animators and artists simulate rain, confetti, or fairy dust emanating from any object in the Typestry scene. Particles seem to obey the law of physics, falling and bouncing like a shower of sparks.

Two new object-creation methods offer a host of possibilities. Using the Tubes mode and then applying a glow shader allows you to create type that looks like a neon sign. The rubber-sheet effect allows fonts to act as if they're on a thin, pliable sheet of rubber with type stenciled on or cut out of the sheet. This surface responds to wind and gravity.

The program is easier to use than the previous version. A new icon palette allows easy access to tools, and a timeline window makes animation setup much simpler. 510-236-4000. $299. / Sean Safreed

ADD A LITTLE HUMOR to your layouts — and help AIDS charities in the process — with two shareware collections of pre-World War II clip art. Zippy Pictures and Snappy Pictures each contain more than 40 EPS graphics in Illustrator format. Send your tax-deductible contribution of $20 (or more) to Zippy Pictures, 10809 McIntyre Street, Oakland, CA 94605. All proceeds go to organizations that fight AIDS. / Pamela Pfiffner

NOSTALGIC IMAGES /

LOOKING BACK AT AMERICA

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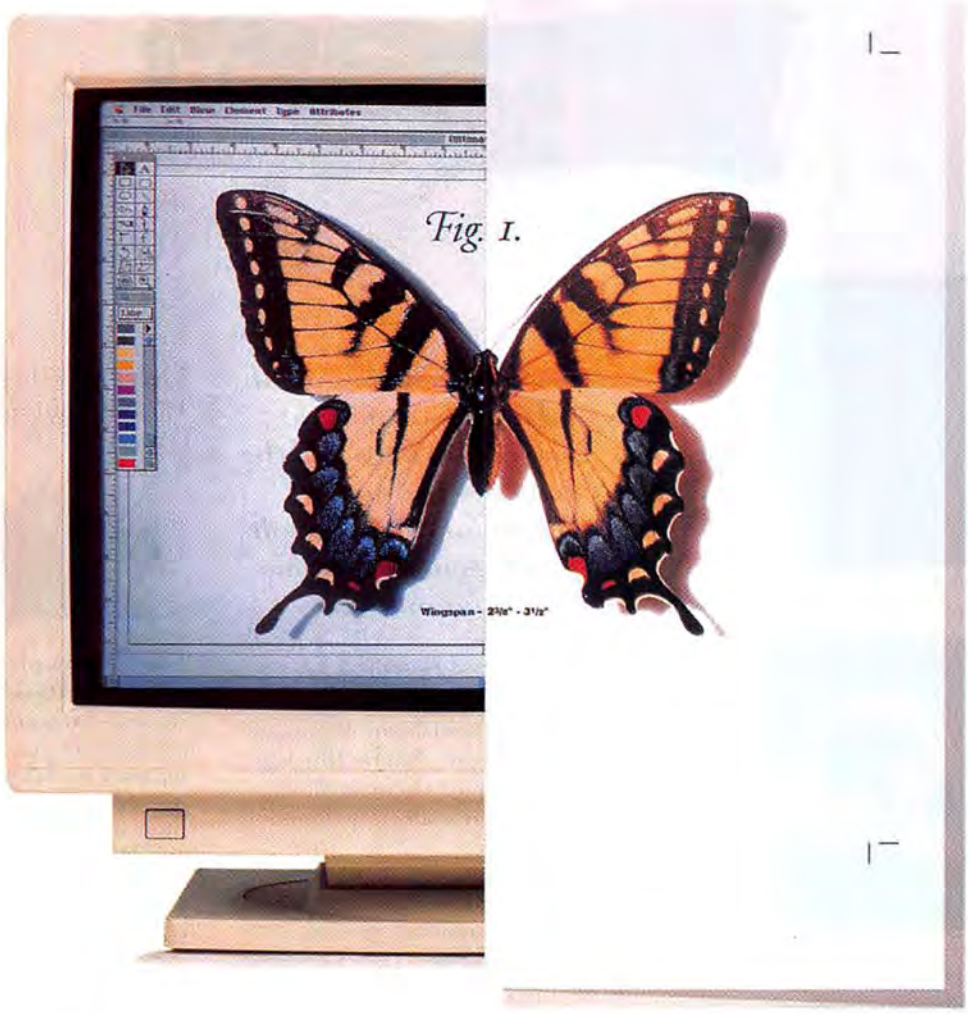

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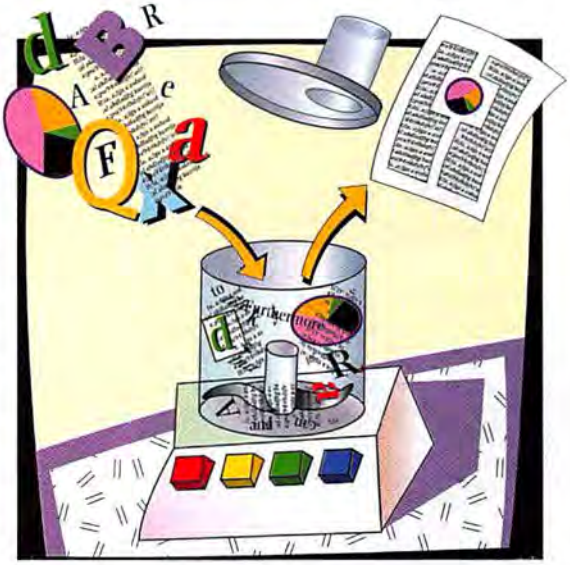
When Word Processors Will Do

Can word processors do double duty as page-layout programs? Yes, if you're willing to accept some limitations. BY ERIC TAUB



NOT LONG AGO if you wanted to create a document with more than the simplest design — with multiple columns and graphic elements, for instance — you had to use a page-layout, or desktop-publishing, program. But as word processors have added rudimentary layout and graphics capabilities, many users have found that they don't need the sophistication of page-layout programs to produce newsletters, corporate reports, and the like. It's not surprising that page-layout applications are losing ground to word-processing programs.

The most compelling reason to use a word processor instead of a desktop-publishing program is, of course, price. Word processors cost less than the page-layout heavyweights Aldus PageMaker and Quark's QuarkXPress, although they're priced a bit higher than low-end page-layout programs such as Aldus Personal Press or TimeWorks' Publish-It! Easy. But because page-layout programs are usually purchased in addition to applications used for entering text, you save cash by simply buying MacWrite Pro for $249 and not shelling out another $895 for QuarkXPress or $199 for Personal Press.

Another advantage is that word processors have relatively economical system requirements. High-end page-layout programs prefer Mac II-class machines with *at least* 5 megabytes of RAM, running System 7. MacWrite Pro on the other hand, runs comfortably on a Mac SE with 2 megabytes of RAM and System 6.0.5.

Word processors also offer powerful automation features that are lacking in many page-layout packages, such as automatic tables of contents, indexes, and footnote references; layouts linked to style sheets; headers, footers, and footnotes; and mail-merge.

But word processors lack typographical sophistication and professional color capabilities. And if your layout calls for stories to jump from page to page, be warned: Word processors can't link multiple stories throughout a single document. Because of these omissions, word processors lend themselves to projects such as newsletters, annual financial reports, manuals, and book-length projects.

Now let's take a look at how four Mac word processors — MacWrite Pro, from Claris; Microsoft Word, from Microsoft Corp.; Nisus, from Nisus Software; and

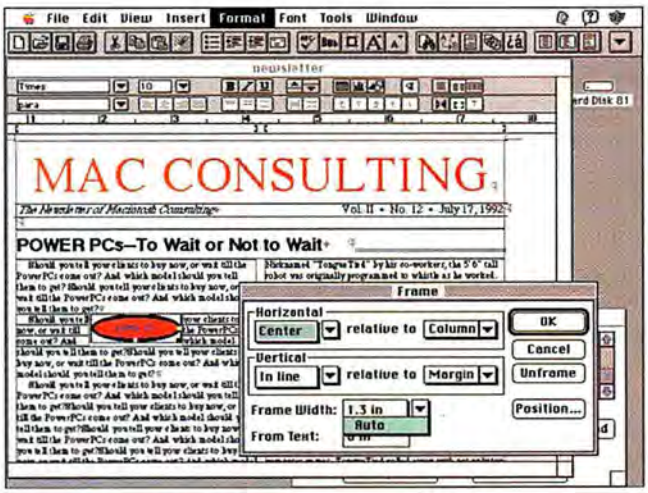


figure 1 / **To exactly position** page elements in Microsoft Word, you have to master the intricacies of this dialog box. Alone among word processors, Word doesn't let you resize page elements by dragging; you must specify the width in this dialog box. Word can wrap a column of text around both sides of a graphic, however.

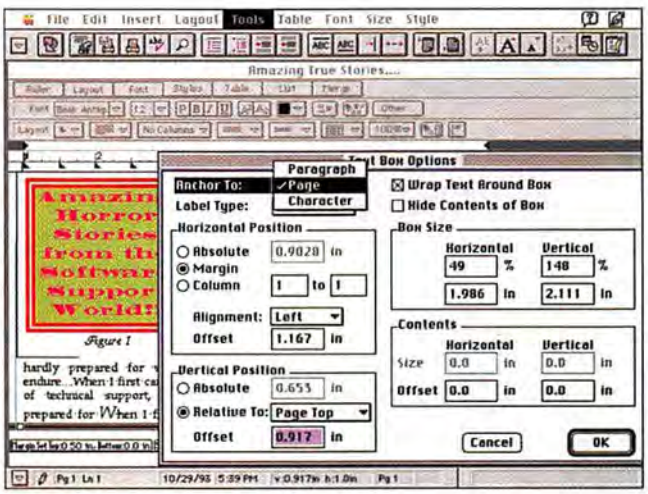
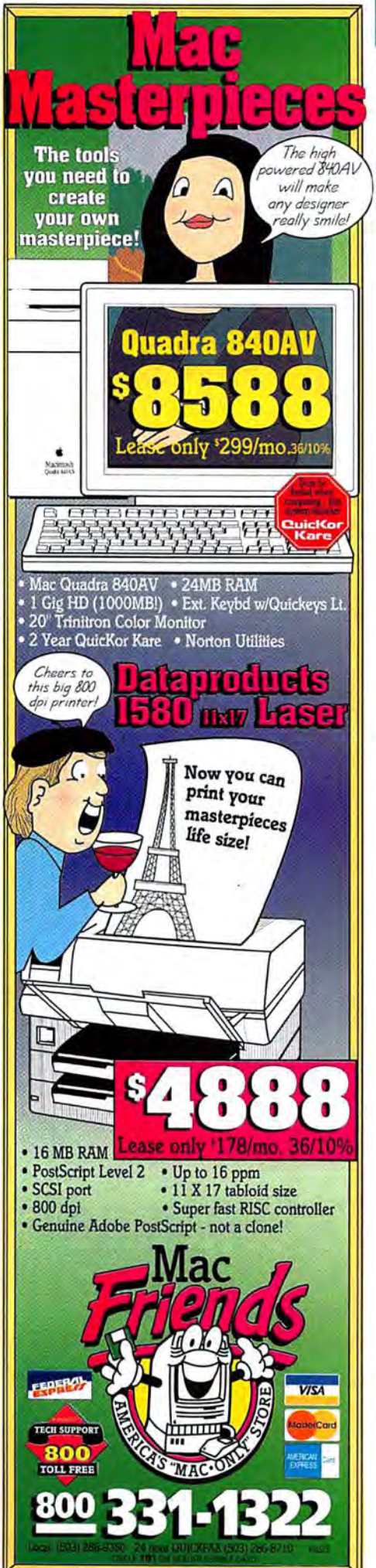


figure 2 / **WordPerfect's dialog box** for positioning page elements is easier to understand than Word's, and WordPerfect also offers numbering and automatic positioning of labels for picture boxes and text boxes.



WordPerfect, from WordPerfect Corp. — stack up as page-layout programs in terms of layout, typography, and graphics.

Layout

Placing Elements. The most fundamental part of creating a publication is how you position text or graphic elements on a page. Page-layout programs give you extremely precise controls for placing text and graphics, but you're limited to either positioning a graphic at a specific location on a specific page or inserting it in text as an in-line graphic. Word-processing programs take a text-oriented approach.

Nisus, Word, and WordPerfect have options for attaching graphic or text elements to paragraphs, but MacWrite Pro anchors them to text — an approach similar to in-line graphics in page-layout programs — or page coordinates. The advantage of attaching elements to paragraphs is this: If editing forces a paragraph to move up or down on a page (or from page to page), a graphic anchored to that paragraph can move vertically with the text yet retain its horizontal positioning. Especially for long documents, such automated formatting is one advantage word processors have over the more labor-intensive page-layout programs (except for Frame Technology's highly automated FrameMaker).

Word offers the most extensive automated page-layout features, but they're difficult to access. You use Word's Frame command to specify the location of elements on the page, but you don't actually draw a frame, as you do in MacWrite Pro or WordPerfect. Rather, you specify the location, orientation, and size of a paragraph through a series of dialog boxes (see figure 1). To place a graphic, you must first insert it in a paragraph and then define how you want that paragraph positioned relative to the column, margin, or page.

Once you've figured out its dialog boxes, you'll appreciate the flexibility of Word: It's the only program discussed here that automatically adjusts an element's position in the margin of a facing page, so that, for example, a picture appearing in the left margin of an even page automatically moves to the right margin of an odd page, if necessary.

Nisus and WordPerfect let you anchor elements to paragraphs or pages, just as Word does (see figure 2). WordPerfect lets you draw, position, or resize text or picture frames directly on a page. Nisus is the only one that doesn't require you to enter precise values in dialog boxes for positioning elements. Instead, layout is strictly click-and-drag.

Like WordPerfect, MacWrite Pro makes it easy to draw and position text, picture, or table frames on its pages, but its anchoring capabilities are more limited than those in the other programs. You can anchor elements to page coordinates or to text as in-line graphics, but you can have paragraph-level anchoring only if you turn text wrap off, which limits your design options.

Columns. Word processors aren't as flexible as page-layout programs for creating columns. In MacWrite Pro and Word, you can change the number of columns anytime throughout a document (you must insert a section break first) as well as mix the number of columns on a single page. MacWrite Pro goes one step further and allows you to change the width of individual columns, as does WordPerfect, although in the latter, you can't change the number of columns on a given page. The most limited word processor in this respect, Nisus requires equal-sized columns, and you must use the same number of columns throughout an entire document.

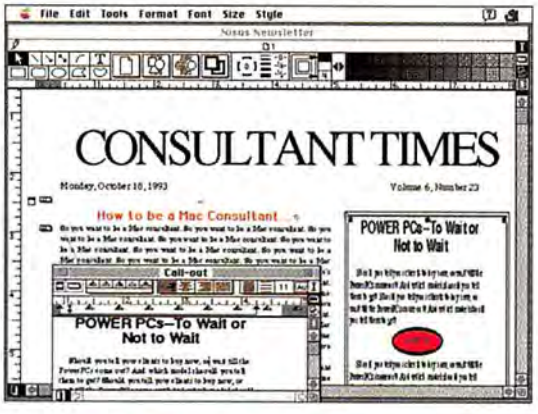


figure 3 / **Nisus uses a confusing** icon bar for creating graphic elements. You can place one Nisus document inside another (see the window at the bottom of the screen and the placed document at the right). Any changes to the embedded document are reflected in its linked twin.

DESIGN / *ways with word processors*

Learn how to use your program's automated-layout features. In Word, you can incorporate exact positioning into a style sheet to instantly place graphics where you want them and then quickly modify your entire document's design by changing how the style's defined.

Respect your program's limitations. Most word-processing programs are weak typographically, so avoid designs that demand precise typography.

Don't be ambitious with color. Word processors aren't designed for professional color output. If you need to print many color copies, you're restricted to printing on color-inkjet or thermal-wax printers or using color laser copiers, which have a higher cost per page than offset printing.

Keep your designs simple, and use plenty of white space. If your document repaginates, you can end up with graphics or other page elements overlapping in ways you didn't intend. The simpler and roomier your design, the less the chance this will happen.

Typography

Kerning and Tracking. No word-processing program can match the typographic sophistication of page-layout programs, but among the word processors, MacWrite Pro is superior. MacWrite Pro is the only one of the four that uses the kerning-pair information designers build in to fonts to make the spacing between certain letter combinations look more appealing. It's baffling why none of the other word processors take advantage of this information.

In addition, only MacWrite Pro lets you manually adjust the spacing between pairs of characters (kerning) and in a range of text (tracking) in units as fine as $^1/_{100}$ of an em space. An em space is the width of a capital *M* for a given font and type size, so any kerning and tracking you define in MacWrite Pro will adjust proportionally if you decide to increase or decrease the size of the type you've kerned or tracked. The other word processors require that you adjust type in either a 1-point or a $^1/_4$-point increment.

There are two problems with point-based adjusting: First, a point is a fixed size, so type kerned or tracked this way looks terrible when the type size changes. (Nisus has an option for automatically scaling point-based tracking in such cases.) By basing its spacing on em spaces, MacWrite Pro protects you from this potential headache. Second, 1-point and $^1/_4$-point increments are too coarse to be effective, especially with small type; for large type, the programs also impose limitations on how much the type can be condensed or expanded.

Word doesn't offer true kerning, but its cumbersome Spacing controls let you condense or expand lines of type for an effect similar to tracking. If you're brave, you can use Word's complicated formulas for mathematical typesetting to kern pairs more precisely. WordPerfect lets you kern pairs (only in 1-point increments), but you can't track ranges of text. On the other hand, Nisus lets you track ranges of text, but you can't kern letters.

figure 4 / **MacWrite Pro is the only one** of these word processors that can wrap text around irregularly shaped graphics. You should note, however, that it can't flow the text from a single column on both sides of a graphic simultaneously.

Type Tricks. Each program has some typographical bells and whistles. Nisus, Word, and WordPerfect can automatically create drop caps, and Nisus offers a broad range of unusual character styles — including boxed, inverted (reversed), and invisible text.

Graphics

Tools. Nisus, Word, and WordPerfect have built-in drawing modules, but WordPerfect stands

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alone in having a Bézier drawing tool. Word's feeble drawing module is good for little more than producing the simplest labels and boxes, but you can use Microsoft Graph (included with Word) to create surprisingly sophisticated charts. Nisus' spare drawing module is more useful than Word's, and you can embed one Nisus document inside another (see figure 3). MacWrite Pro has no drawing capabilities.

File Import. As far as importing graphics is concerned, Nisus supports anything you can paste from the Clipboard — in other words, not much. The other three let you import EPS, MacPaint, PICT, and TIFF files and QuickTime movies, with WordPerfect adding GIF (graphics interchange format) files.

Text Wrap. Word-processing applications can wrap text around graphics automatically, as page-layout programs can, but only in limited fashion. Only MacWrite Pro runs text around irregularly shaped graphics (see figure 4). If you stick an element into the middle of a column, Nisus and Word will flow the text on both sides of the object, but MacWrite Pro and WordPerfect will flow the text on the wider side.

Getting text to flow over or under, rather than around, a graphic is tricky. Nisus and MacWrite Pro let you easily turn off text wrap with a click or two. You can't turn off text wrap in Word, but you can tinker with the Frame command to get the same effect. In WordPerfect, you have to either place a graphic into an overlay so text flows behind it or make it a watermark so text flows in front of it. In MacWrite Pro, text can be in back of an object but not in front of it.

Color. The greatest color support is found in WordPerfect, with millions of colors, and MacWrite Pro, with 81 colors. Word offers the original 8 QuickDraw colors (black, white, red, green, blue, cyan, magenta, and yellow), and Nisus offers these 8 for text, but its graphics are black-and-white only.

Special Features

Word processors surpass page-layout programs in terms of several features, some of which are not described here. But if you're working on long documents or doing database publishing, word processors can be attractive: Nisus, Word, and WordPerfect have powerful features for generating tables of contents, indexes, footnotes, and more.

MacWrite Pro 1.0
COMPANY: Claris Corp., Santa Clara, CA; 800-325-2747 or 408-727-8227.
LIST PRICE: $249.

Microsoft Word 5.1
COMPANY: Microsoft Corp., Redmond, WA; 800-426-9400 or 206-882-8080.
LIST PRICE: $495.

Nisus 3.4
COMPANY: Nisus Software, Solana Beach, CA; 800-922-2993 or 619-481-1477.
LIST PRICE: $495.

WordPerfect 3.0
COMPANY: WordPerfect Corp., Orem, UT; 800-451-5151 or 801-225-5000.
LIST PRICE: $495.

Nisus and WordPerfect enable you to create cross-references that update automatically (Nisus' are easier to use, whereas WordPerfect's are more flexible). And all four programs offer substantial support for mail-merge, providing database-publishing features the big page-layout programs can't provide without expensive add-on programs such as Em Software's Xdata for QuarkXPress.

Nisus' GREP (Global Regular Expression Parser) feature enables you to use "pattern matching" to perform search-and-replace operations that are more sophisticated than those found in any other word-processing or page-layout program. For example, you might automatically change the font and size of the first five characters of every paragraph.

Which Word?

If you're looking for a word processor that can do double duty, you'll find that its type controls and text-wrap options make MacWrite Pro a solid choice for projects, such as newsletter production, that require a fair amount of design control. WordPerfect's approach to layout is flexible and the program is easy to use, making it relatively easy to set up long documents. Although Nisus and Word are both packed with features, those features are a little harder to reach. But remember: These are *word processors.*

Eric Taub is a New York-based writer who specializes in desktop publishing and graphics.

What a Relief

Photoshop's Emboss filters are fine, as far as they go, but here's a technique that gives you complete control when you're applying embossed effects to images. BY KAI KRAUSE

THIS MONTH, we start with a pretty neat Photoshop trick: embossing without the Emboss filter — in real time! From there, we venture to effects for which there is no filter. As usual, this technique is not confined to the examples shown here; I encourage you to follow the concepts rather than the exact images and pixels.

First, let's revisit a principle of channel calculations (what I call *chops*, short for *channel operations*): Combining two images with a blend set to 50 percent simply averages the pixels in each channel. As I described in "More Algorithmic Painting" (October '93, page 127), this means that an image blended with an inverted copy of itself will cancel out to a medium gray. For example, if the image is solid white, each pixel has a gray-scale level of 255, which is the value for full white in an 8-bit-per-channel Photoshop file; if the inverted copy is solid black, each pixel has a value of 0. The blend is half of 255 + 0, or 127. It should be 127.5, but the system's requirement for round numbers results in mathematical inaccuracies such as this (which lead to banding and other artifacts).

Relief Worker

Let's use this channel-calculation principle creatively. You can start with any image — gray-scale or color, RGB or CMYK. The first example has black text on a white background (see figure 1).

Here's a trick: Hold down the Command key, and type the following letters in sequence: *ACVIH* (no spaces). In just a few seconds, you've performed several tasks. Now let's decipher what happened:

Command-A (Select All) selects the entire image and surrounds it with the selection marquee's little marching ants. Command-C (Copy) copies the selection to an invisible buffer area. Command-V (Paste) pastes the contents of that buffer area into the window, superimposed (or *floating*) in a layer above the original image. Command-I (Invert) inverts the current selection; that is, every pixel in each channel is changed from *x* (where *x* is its current value) to 255 minus *x*. Command-H (Hide Edges) hides the marching ants for the sake of simplicity, aesthetics, and speed. (This step is not strictly necessary but is recommended.)

Now go to Composite Controls, on the Edit menu. (In Photoshop 2.0, it's called Paste Controls; the dialog box looks a little different, but the trick works fine, just the same.) This dialog box lets you determine how the pasted selection will be applied to the image underneath it.

Set the Opacity to 50 percent (see figure 2). It will look as if you had just wiped out your image, leaving in its place nothing but

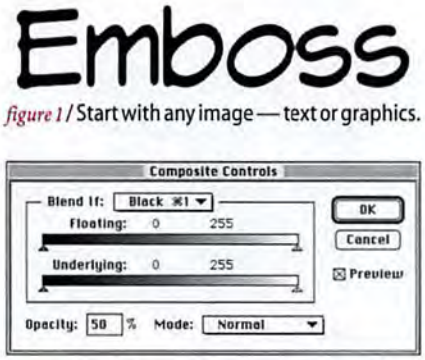


figure 1 / Start with any image — text or graphics.

figure 2 / Use Composite Controls to create a 50-percent blend.

figure 3 / Moving the top layer puts edges in bold relief.

a plain gray window. Click on OK.

Now the fun really begins: Press any one of the arrow keys — go on, just do it.

Voilà! Real-time embossing!

"So what's going on?" you might ask. At first, each pixel cancels the other out, but as you shift the original image from its inverted copy, pixels no longer match up. This makes some parts show up with edges in 3-D relief. If you steer the top layer around at this point (using the arrow keys), it looks as if a virtual sun is casting shadows up, down, left, or right.

This may seem like merely a cooler way to get the same results the Emboss filter gives you, but you'd be surprised how much control you have over the embossing when you use this technique. The embossed effect is no longer based on numbers you type blindly into a dialog box with no visual feedback but rather on your watching and gauging the effect on the image itself. Compare the two methods yourself.

In figure 3, you can see how your virtual sun changes position as you press the arrow keys. Note that in the case of text, it's often useful to apply a Gaussian Blur first (see the bottom row). The basic advantage of this approach is that you can move the floating selection around while keeping the Opacity blend effect active.

Embossing Situations

You can quickly broaden your repertoire of results. How about blending two blurred copies and then a sharp one over that? Or two sharp copies and a blurry one? Or two of each? How about trying a blend other than 50 percent? In color, how about applying the effect to only the red channel? You can simply use Command-V to paste another copy on top of your image and Command-I to invert the copy; moving the top image while holding down the Option key leaves a copy behind.

There are so many permutations, it can drive you nuts. Figure 4 shows just a few examples. See if you can figure out how to achieve them. You can probably come up with a bevy of new ones too: You're in complete control of the process, and you can use it on any image.

'SO WHAT'S GOING ON?' you might ask. At first, each pixel cancels the other out, but then the pixels no longer match up. It looks as if a virtual sun is casting shadows up, down, left, or right.

Let's step back a little and ponder this process in the abstract. Imagine rotating the top layer a few degrees. The center will still cancel out while the outer areas shift and take on an embossed appearance — in a kind of radial-emboss effect. Or consider applying the ZigZag filter (under Distort, on the Filter menu) to the copy before blending, to create embossed circles and waves through an image. What if you apply a Mosaic filter (under Stylize, on the Filter menu) to the second layer? Also under Stylize, check out the Facet filter. (You can apply it while the image is floating in 50-percent opacity and still move the layer with the arrow keys!) Obvious effects such as Find Edges (also under Stylize) are taken to a whole new level when applied within these combinations.

Further permutations arise when you try other settings in the Composite Controls dialog box. Applying 50-percent opacity to the Luminosity or Color mode results in very cool rainbows at the edges of your image and smooth shadow lines. Photoshop's Flowers test image served as a source for figure 5, which shows some of these subtle effects.

By now, it should be clear that this approach to embossing can yield much more complex results than using the Emboss filter. I hope it's a gateway for deeper exploration as well.

There goes your weekend . . . .

Kai Krause invites you to share your Photoshop experiments with *MacUser* via ZiffNet/Mac in its Desktop Publishing forum or America Online's Photoshop forum. When he's not doling out Photoshop tips, Kai is vice president of research and development at HSC Software.

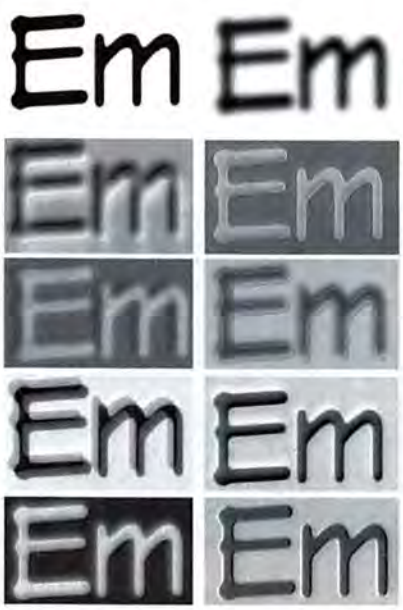
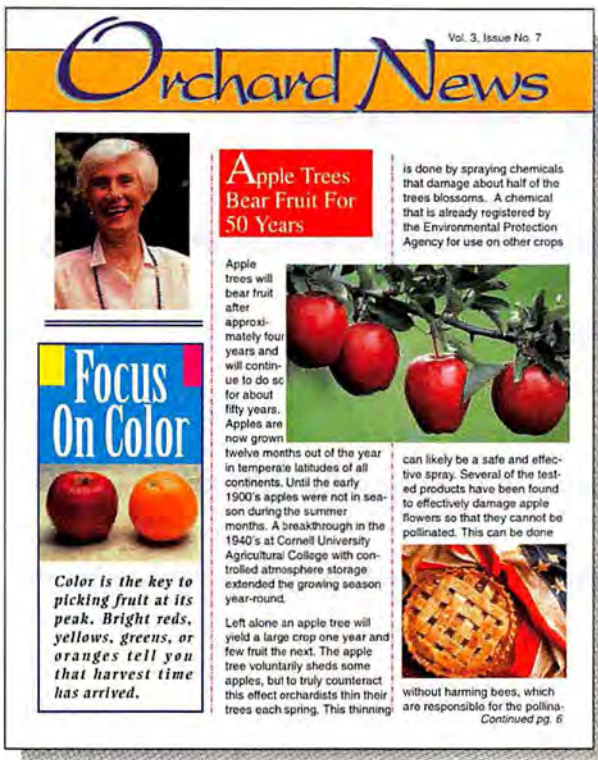


figure 4 / Combine these embossing techniques with filters to create variations.

figure 5 / Experiment with color for subtle effects.



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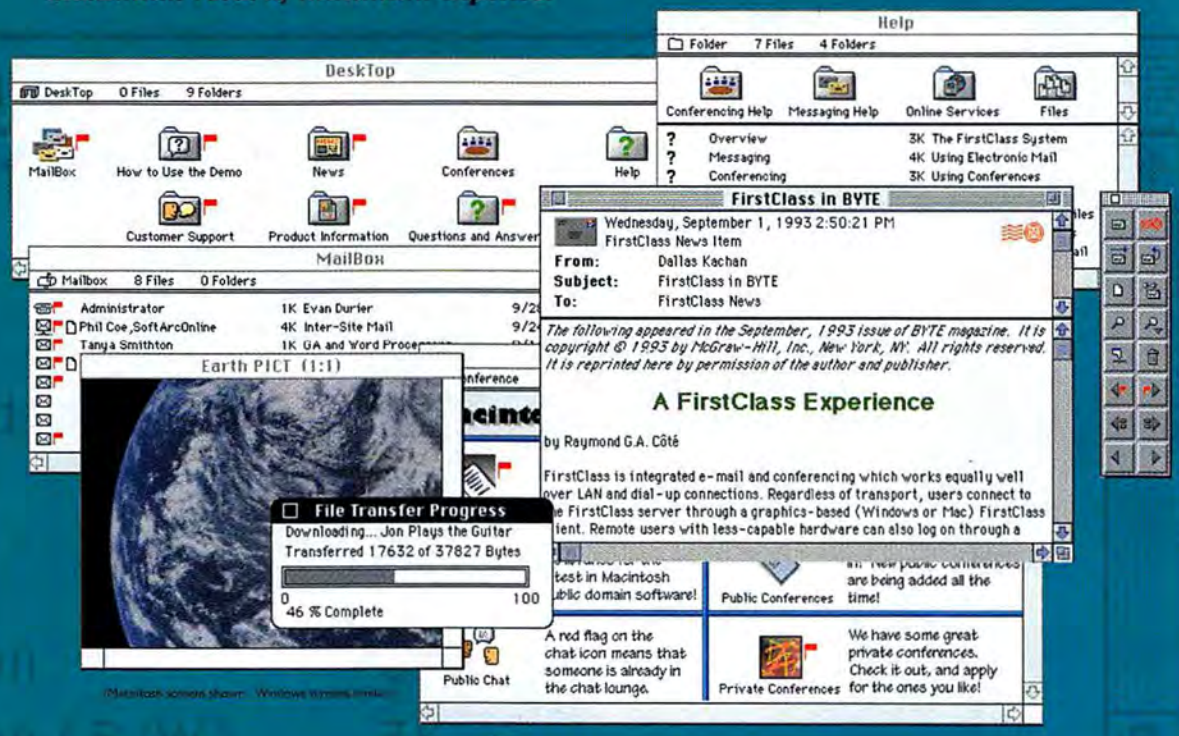

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HANDS ON Bridges

LANs: APPLE'S NEW ARA

AFTER TWO LONG YEARS, Apple has finally added robust security and multiple-modem support to its remote-access software. There are now three products: Apple Remote Access Client ($69), Apple Remote Access Personal Server ($249), and Apple Remote Access Multiport Server ($1,799 for 4 modem ports).

The new ARA Client software includes a feature called DialAssist, which automatically adds prefixes such as area and country codes and long-distance prefixes to phone numbers you dial. The client software can be used to access Personal Server, which uses a single modem, or Multiport Server, which comes with a four-port serial card. You can have as many as 16 ports on the Mac running Multiport Server by adding 4-port upgrade cards ($1,499 each). Each server-software package can run on a Mac already running other network services, such as mail- or file-server services.

The new ARA products add almost a dozen security features, including password aging, the filtering of access to zones and network services by account, the disabling of connections after a set number of attempts, and support for security systems running on other computers. New management features include SNMP (Simple Network Management Protocol), the ability to send messages to users, and the ability to manage the network by each port or by each user.

The new software also lets you connect to a network by means other than a standard modem. Apple is offering a plug-in module for X.25 access, with modules for cellular and ISDN connections to come later from Apple or third parties.

By the way, the *Talk* has been taken out of *AppleTalk Remote Access*, because Apple plans to add multiprotocol, multiplatform support to ARA in the future, including support for Windows clients and support for the PPP (point-to-point) protocol. / John Rizzo

COMMUNICATIONS / MAC VOICE-MAIL

TURN YOUR MAC INTO AN AUTOMATED voice-mail system with WaterMark Voice Mail 2.0 ($449), from High Tide Software (510-704-9927). This low-cost, easy-to-use system lets you create a sophisticated multiple-choice voice-mail system similar to those costing thousands of dollars. With no programming or scripting, you can create systems that prompt callers for information. Callers can enter information either by voice or by entering numbers on their telephone keypad. WaterMark Voice Mail comes with send/receive fax software and a modem. / John Rizzo

WIRELESS / IT'S IN THE AIR

THE NEW YEAR BRINGS two new wireless products. The Air Communicator ($1,495), from Air Communications (408-749-9883), is a high-speed cellular voice/fax modem capable of a data-transmission rate as high as 57,600 bps and a fax-transmission rate as high as 14,400 bps. The unit's battery lasts 2.5 hours in continuous operation and 15 hours in standby mode.

The Grouper, from Digital Ocean (913-888-3380), lets you set up your own cellular network in your office by creating a radio-frequency LocalTalk network that can be connected to a wired LocalTalk or Ethernet backbone. Each unit has a radius of 800 feet and plugs in to your Mac's printer port. A future version will be available as a NuBus card, and the GrouperMP will be available for the Newton MessagePad. Pricing was not available at press time. / John Rizzo

ON-LINE / ride the info highway

BET YOU DIDN'T KNOW THAT TED TURNER would be among the first on the information superhighway. The Prodigy on-line service (914-993-8000) has teamed up with 20 cable networks, including CNN, The Discovery Channel, and TNT, to provide services that augment cable-TV programming. Viewers who have computers and modems will be able to provide feedback on their favorite or least favorite programming via viewer polls. Viewers will also be able to download program highlights and listings and talk to other viewers on bulletin boards.

Not to be outdone by CNN, the Clinton administration has been making more kinds of information available on-line. For instance, the Smithsonian's National Museum of Art is using America Online (703-448-8700) to distribute its journal *American Art* as well as Photo CD images from its book of African culture *Free Within Ourselves*. The Smithsonian's New Media Initiative has already created access to four other Smithsonian units — including the Air and Space Museum — on America Online. / John Rizzo

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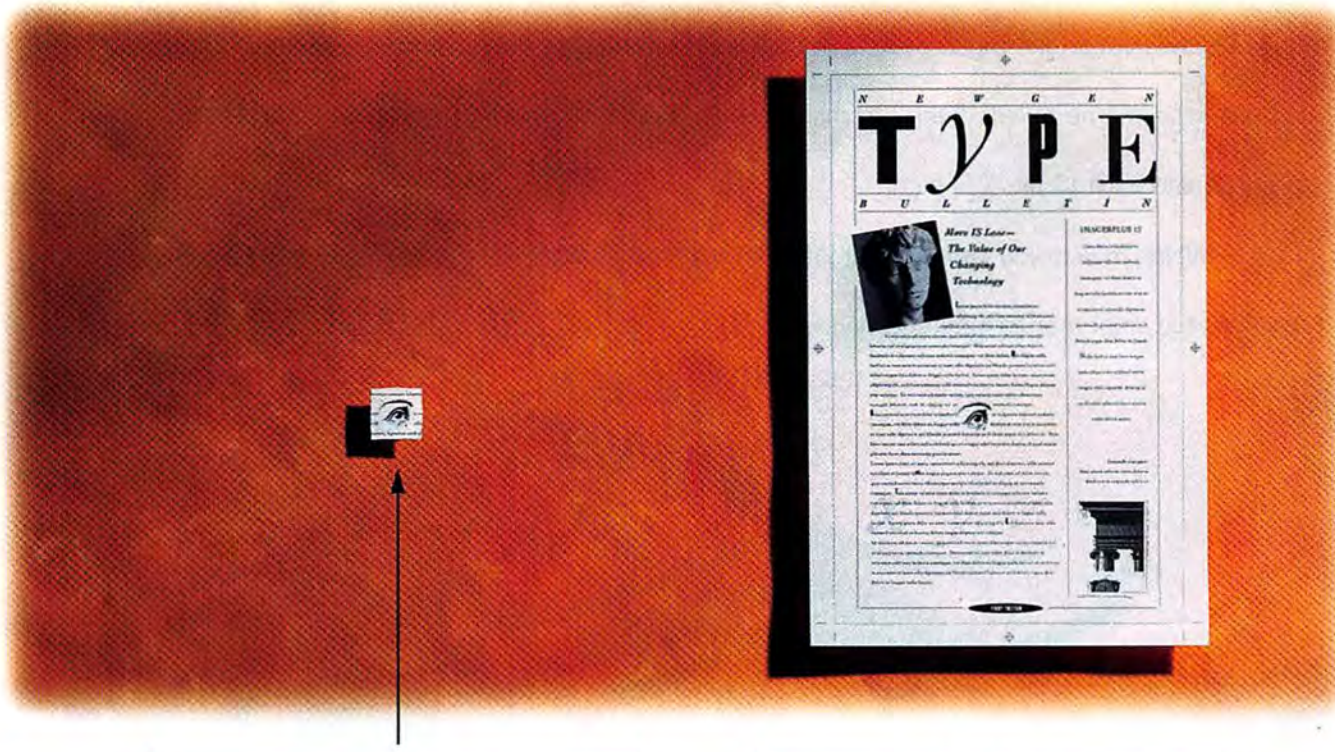

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Network Help

How to adjust PrintMonitor, exorcise those AppleShare-server ghosts, and rename router zones. BY KURT VANDERSLUIS

HERE ARE SOME OF THE questions I get most frequently in my travels as a network consultant and instructor. In future issues, I'll answer questions from readers.

Printing RAM

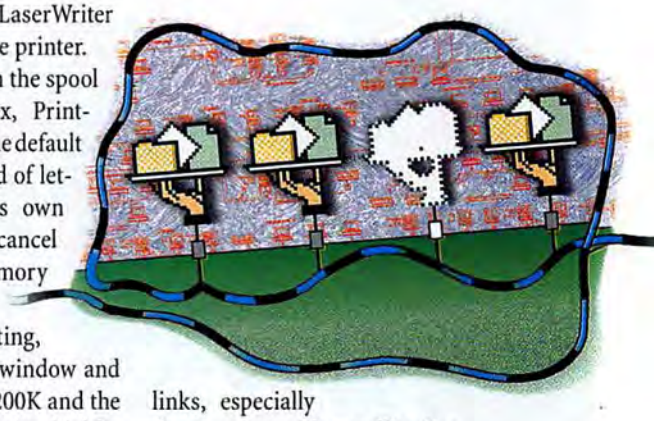
Q. Why, during background printing, do I sometimes get a message that says PrintMonitor needs more memory?

A. PrintMonitor is an application and, therefore, needs RAM to accomplish its functions. Here's what happens:

Instead of printing directly, your application creates a file of all the drawing commands necessary to print the document. This file, the *spool file*, is placed in the PrintMonitor Documents folder, in the System Folder. PrintMonitor checks this folder periodically to see if there are any spool files. If there are, PrintMonitor forwards the drawing commands to the LaserWriter driver, which sends them to the printer.

If the drawing commands in the spool file are particularly complex, PrintMonitor may need more than the default setting of 80K of RAM. Instead of letting PrintMonitor modify its own memory setting, you should cancel the print job and set the memory manually.

To change the memory setting, go to PrintMonitor's Get Info window and set the minimum memory to 200K and the preferred memory to 400K. You shouldn't be bothered again by the out-of-memory message. Once you've changed the setting, you may also find that midlevel Macs, such as the SE/30 and IIsi, function more smoothly while you're printing.



Vanishing Servers

Q. In our company's WAN (wide-area network), we often see AppleShare servers in other cities fade in and out of the Chooser. When we're finally able to make the connection, it's solid. Is this normal? Is there anything I can do to improve the connection?

A. The timers used by the AppleShare Chooser extension are set to work best in LANs (local-area networks). The behavior you report is common across slower WAN links, especially those connected by satellite. You can use ResEdit to change the AppleShare timers so that the Chooser works better with the longer response times typical of a WAN.

In ResEdit, open a copy of the AppleShare extension and edit GNRL resource –4096 with the hex editor. There are two hexadecimal bytes, which by default are set to $07 and $05. The first number controls how often the Chooser repeats a request, and the second controls how many times the request is repeated before a new request (with a different identifying number) is issued. The default values give distant AppleShare servers four seconds to respond before the Chooser issues a new request. Change the first value to $10 and the second to $0A. The

Write to Network Help

c/o *MacUser*
950 Tower Lane
18th Floor
Foster City, CA 94404
You can also send your question to Kurt VanderSluis on AppleLink at KVANDERSLUIS.

BREAKING THE RULES / *LocalTalk termination*

Q. I'm pretty sure I understand the ins and outs of termination rules for LocalTalk, but here's something that stumps me: Sometimes when I do the exact opposite of what the PhoneNET manual says, my network works better. For instance, if I remove a terminator I'm not supposed to, printing doesn't take as long. Why is this?

A. Below-average performance usually indicates that there's a termination problem lurking somewhere in the LocalTalk network. If you're on a passive star with poor performance, a branch other than the one you're on probably isn't terminated properly. If your connector is also improperly terminated, although your Macintosh's performance may improve, you simply move the problem to some other location on the network. Similarly, if you are breaking the rules toward the end of a LocalTalk bus, the termination problem will show up at the other end of the bus. Even though you may be able to print faster from your computer, others on the network will experience problems.

This interesting little phenomenon happens only with LocalTalk, by the way. An "advantage" of Ethernet is that you can't create a network that only sort-of works: A coaxial Ethernet network with improper termination simply doesn't work at all.

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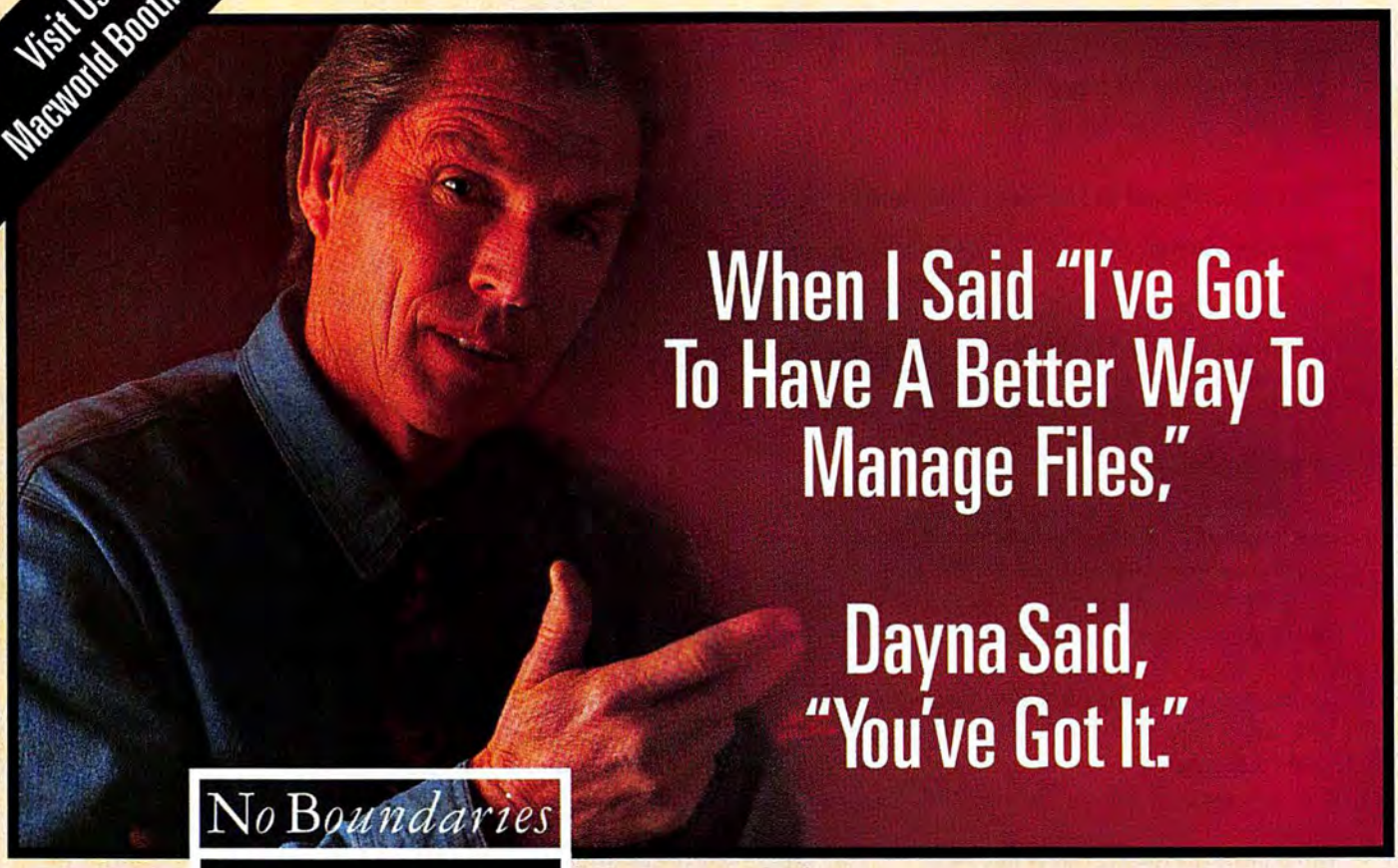

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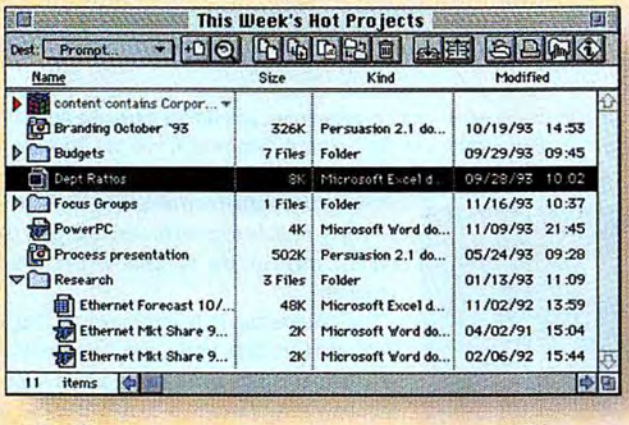

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allowable response time will increase to about 20 seconds, enough for most WANs.

If you're having this ghosting problem within your LAN, the problem is faulty wiring or bad termination, not timing.

Changing Zones

Q. When I change the name of a zone in my router's setup, how long should I leave the router off-line?

A. It depends on the setup of your network. Let's say you want to change the definition of Network 12, which is currently the Sales zone, to Network 12, Zone Western Sales. You need to reconfigure each seed router connected to this network and turn off each nonseed router connected to the network. After waiting for all the other routers on the internet to age out their information about Network 12, turn the nonseed routers back on. If you don't wait long enough, some routers may continue to use the old zone name.

How long is long enough? If your internet has no redundant pathways, count the number of hops from the router you're changing to the farthest point in your internet and wait five minutes for each hop before turning the routers back on. If you have simple redundancy, wait ten minutes per hop. If you have massive redundancy, wait 24 hours.

Can't keep the routers off-line that long? You can always change the network number when you change the zone name. For example, you might change the configuration in the seed routers to Zone Western Sales, Network 60,012 (if you're not already using that network number) and immediately turn the routers back on. Network 60,012 will be treated as a new network by all the routers in the internet. The next day, repeat the process, changing the definition back to Network 12, Zone Western Sales. While you're reconfiguring a router, make sure no users are connected to servers through that router, or they may lose their connection.

Once you've finished with the reconfiguration, users will have to reselect their services in the Chooser if you changed the zone name of the LocalTalk network. However, you don't have to restart any of the devices, except QuickMail servers, even if you've changed the zone name and number. EtherTalk is different: You must restart servers and other devices if you change their network number or zone name. There are exceptions, but it's best to restart them too.

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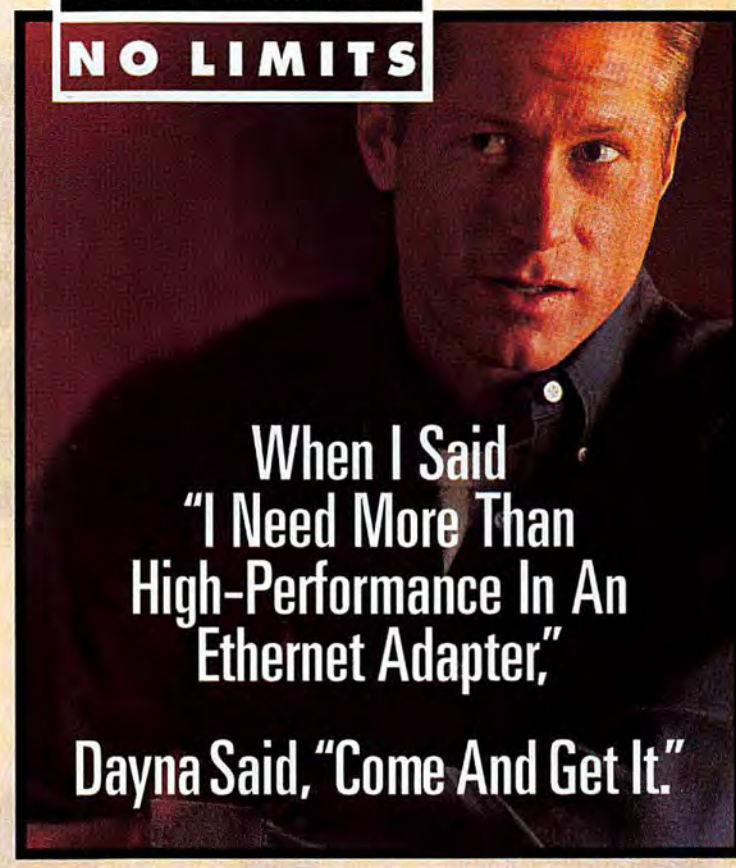

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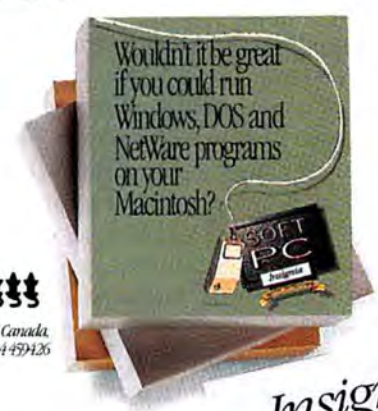

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Serving Up Windows

In the market for a network operating system? Microsoft may have just what you're looking for. Here are five reasons why Windows NT Advanced Server is a wise buy — and five reasons why it isn't. BY JOHN RIZZO

THAT UPSTART MICROSOFT is at it again. This time it's challenging the long-reigning Big Networking dynasty of Novell NetWare, the flexible, best-selling network operating system (NOS) that can handle numerous clients and connect to just about anything. But Microsoft's not stopping there. It's also going after the archduke of the Big Networking dynasty, Banyan VINES, known for its excellent directory services, which help users locate other users and resources on large networks.

Microsoft is hoping to seize Novell's crown with its Windows NT Advanced Server ($1,495 before February 1, 1994; $2,995 after). Microsoft has taken its mid-level LAN Manager Pro network operating system; cleaned up the architecture; added services; and plunked it on top of its high-performance, 32-bit, multitasking Windows NT operating system. The result contains such standard NOS features as disk mirroring and disk-array support for data security. Windows NT Advanced Server can run multiple network protocols at the same time, and an SNA (Systems Network Architecture) gateway is available for connecting NT Advanced Server users to IBM mainframes. And unlike NetWare, NT Advanced Server has Mac-client support and AppleTalk routing built in, at no extra cost.

Will NT Advanced Server succeed in its bid to overtake NetWare and VINES and become the premier NOS? Maybe. Network operating systems are complex, and even the best of them have their good and bad features. After taking a close look at NT Advanced Server, I found good reasons to buy it and equally good reasons to steer clear of it. Here are the results of my research.

Not All Bright and Beautiful

Although it's a good first effort for enterprise server software, NT Advanced Server has its limitations. Among them:

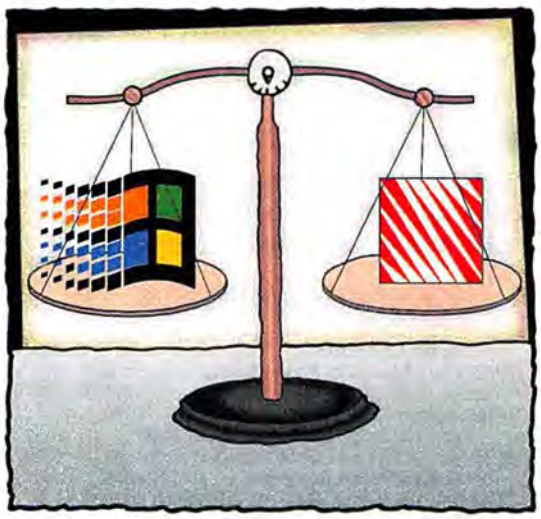
Lack of directory services. NT Advanced Server's most serious drawback, one that prevents it from seriously challenging NetWare in enterprise networks, is its inability to share its directories (lists of users and network resources) with other types of servers. AppleShare (via System 7 Pro and Apple's PowerShare Server), NetWare, and VINES each have this ability.

At press time, Microsoft was offering only vaporware to remedy this problem. A future Enterprise Messaging Server software package will enable NT Advanced Server to share directories with Microsoft Mail server software (but not other types of server software) and, even further in the future, with X.400- and X.500-compliant mail and directory server software. Even more vaporous is Microsoft's Cairo, an as-yet-unannounced but much-publicized future version of NT that is supposed to have directory service built in.

Lack of connectivity with AOCE (Apple Open Collaboration Environment). Novell NetWare and Banyan VINES are already AOCE-savvy. NetWare and VINES each let Mac users access their own directories of users and network resources as well as any other directories each NOS is connected to. At press time, Microsoft had not committed to implementing such connectivity.

Inability to run on PowerPC Macs. Notably missing from the list of platforms NT Advanced Server can run on are those based on the PowerPC 601 RISC chip, which I have seen operating about eight times as fast as the 66-megahertz 486 Intel chip. With PowerPC Macs due to ship early this year, this lack of support is a blow to Mac-based network administrators.

Differences from AppleShare. Although the server software's manuals repeatedly say



NOS / *in the balance*

Can Windows NT Advanced Server dethrone Novell NetWare as the premier network operating system? Although the server software is built on a solid foundation — it's fast and easy to install — its lack of connectivity to the non-Microsoft world is a serious drawback. What's the bottom line? Microsoft has a way to go to catch up with Novell.

Pros

- Speed
- Lots of print options
- Simple installation
- Ability to understand Mac files
- Ability to run cross-platform database applications

Cons

- Lack of directory services
- Lack of connectivity with AOCE
- Inability to run on PowerPC Macs
- Differences from AppleShare
- Lack of Mac administration software

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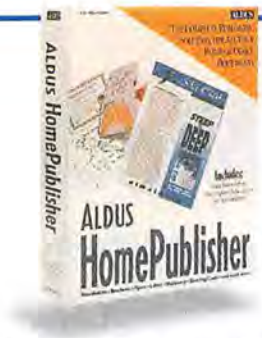

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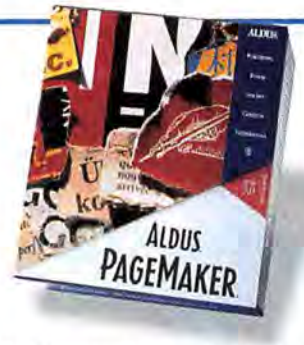

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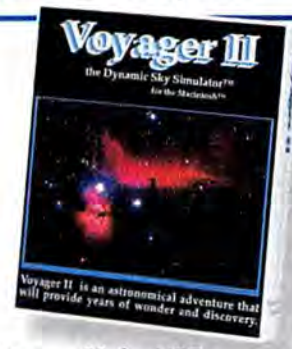

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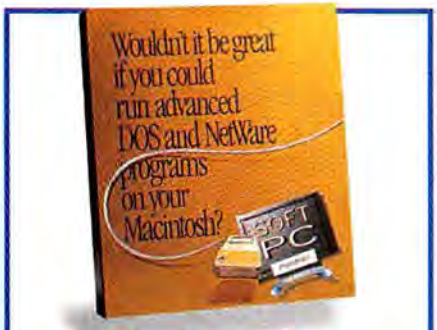

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CIRCLE 43 ON READER SERVICE CARD

Mac users access NT network volumes just as they do AppleShare volumes, there are some differences:

When logging on to the server from the Chooser, for example, you're asked to choose between Apple Standard UAMs and Microsoft Authentication. What Microsoft means by the first choice is the standard password access of AppleShare and System 7's file sharing. Microsoft Authentication, on the other hand, encodes the password over the network. NT Advanced Server doesn't support PowerShare's authentication, which is more sophisticated than NT Advanced Server's password access.

Another feature that is distinctly unlike any of AppleShare's is that you can actually copy a document to a volume for which you have no write privileges! You can't copy to the volume's root level, but you can copy a file to a folder on the volume.

I also discovered incompatibilities that crash the Chooser under System 6.0.7 and 6.0.8 if you choose Microsoft Authentication. Install version 3 of the AppleShare client software on your Macs to remedy this problem.

Lack of Mac administration software. A true multiplatform network operating system should have multiplatform administration capabilities. In its present version, however, NT Advanced Server enables you to administer a network only from the PC running the NT server software or from a PC running the NT client software.

But Not Half Bad Either

Don't get me wrong. NT Advanced Server also has some very attractive features. Here are its strongest selling points:

Speed. From what I've seen, file transfer between a Mac and NT Advanced Server running on a 486 machine is snappy. For those who don't like its speed on Intel 486-based machines, there are also versions for PCs that use Intel's Pentium chip as well as for RISC workstations that have DEC Alpha or MIPS processors.

Lots of print options. In addition to spooling print jobs, NT Advanced Server enables Macs to print to non-PostScript printers connected to the server and enables PCs to print to AppleTalk printers. A built-in 300-dpi RIP (raster-image processor) converts your Mac's PostScript code to a bit-mapped image for printing to non-PostScript PC printers. The RIP is for PostScript Level 1 only and can't take advantage of PostScript Level 2's advanced features.

NT Advanced Server is also aware that Macintoshes with different versions of the LaserWriter driver cause the printer to reset with each user. NT Advanced Server neatly avoids this by taking care of the printer configuration itself, instead of letting each user's Mac download a driver.

Simple installation. If you've never used a PC, you'll find NT Advanced Server much easier to set up than NetWare, which looks totally foreign to most Mac users. The icon-based NT interface isn't hard to figure out, and the AppleTalk-router setup is much like that of standard AppleTalk routers. For extra help, there's a videotape to supplement the manuals.

Ability to understand Mac files. Unlike PC files, Mac files have two parts: a data fork and a resource fork. NT Advanced Server stores the parts together in one file, preventing the possibility of losing a fork. The server software also stores filenames in Mac, DOS, and NT formats and converts the names for the appropriate user. NT Advanced Server uses standard extension mapping to ensure that PC files show up on a Mac desktop with the icons of the analogous Mac applications, so a Mac Excel user can open an Excel for Windows file by double-clicking on it.

Ability to run cross-platform database applications. Developers who are creating SQL-database applications for use with NT Advanced Server don't have to write separate versions for Macintosh and PC users. The Windows Sockets API enables users to access databases over both AppleTalk and PC networks.

So where does that leave us? NT Advanced Server has a sound architecture and is reasonably priced. But it's not there yet. Mostly file- and print-server software, NT Advanced Server is short on other network services, including connectivity with the (non-Microsoft) rest of the world. Rather than adopting Novell's connect-to-anything approach, Microsoft once again wants to set the standard. NetWare's throne is safe, however — for the moment.

MacUser technical editor John Rizzo is the author of *How Macs Work* and *MacUser Guide to Connectivity* (Ziff-Davis Press).

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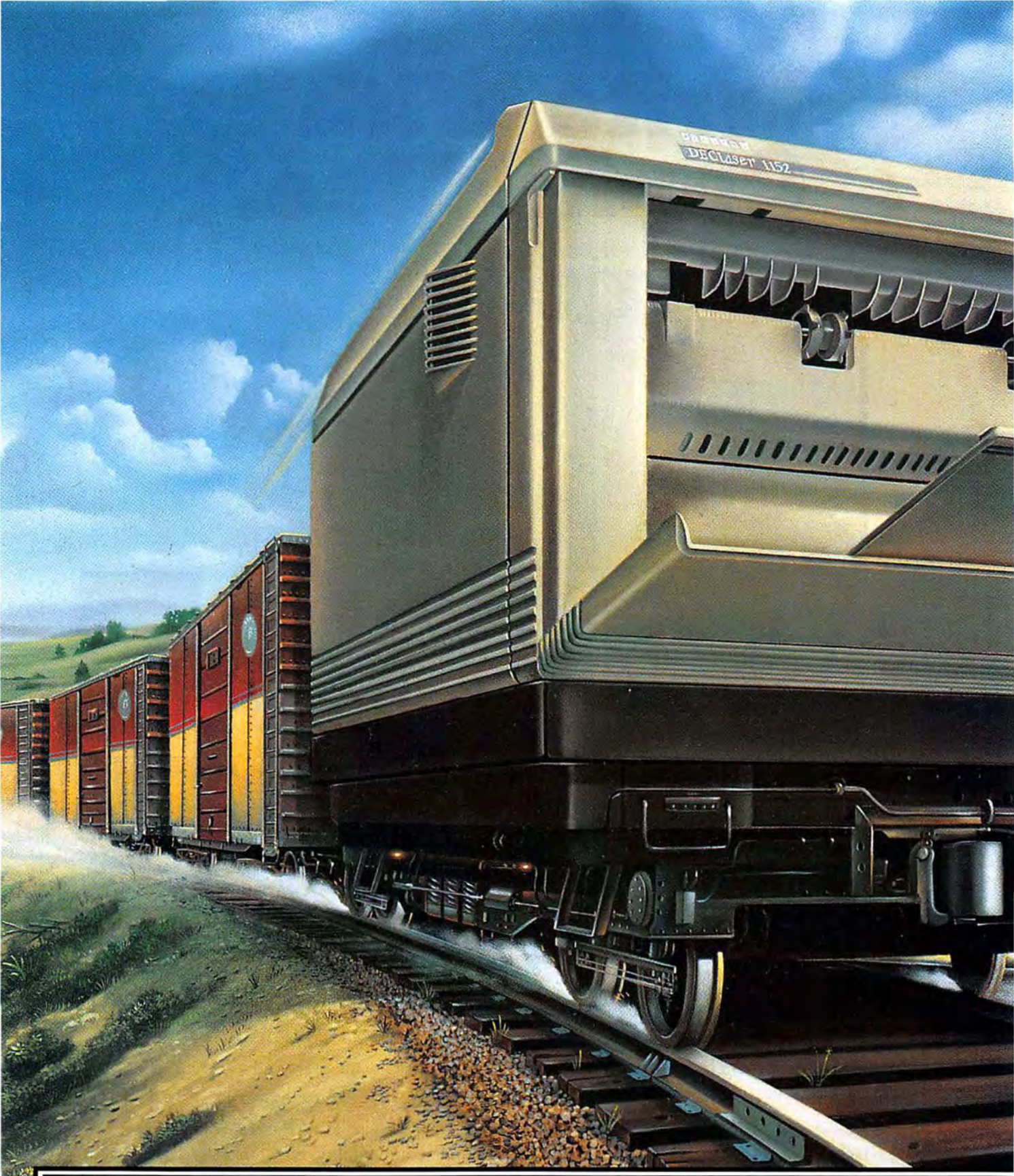

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CIRCLE **158** ON READER SERVICE CARD

PDAs: NEWTON TALKS

Apple finally delivers on its promises of Newton connectivity. BY HENRY BORTMAN

APPLE'S PACKAGING for the original Newton MessagePad described it as a "communications assistant," but most of its communications capabilities were more promise than product when the Newton actually shipped last summer. Although you could buy a fax/data modem for it that sent faxes, you couldn't send or receive any other data. And the built-in infrared transceiver was fine for beaming information to other Newton users — as long as they happened to be within a 3-foot radius.

Shortly thereafter, Newton Connection Kit 1.0 — software that let you back up your Newton's contents to your Mac, edit them on the Mac, and synchronize them with what was on the Newton — appeared. Unfortunately, it couldn't help users who wanted to download their 600-name electronic address books to their Newtons or synchronize their Mac-based electronic calendars with the Newton's Date Book. It also suffered from a text-editing interface that could charitably be described as embarrassing.

Things have improved a bit. NewtonMail, an e-mail system for Newton users, is now up and running, although at press time, Apple couldn't say exactly what it would charge for the service. NewtonMail lets you send messages to and receive them from not only other NewtonMail users but also, via gateways, to and from AppleLink, America Online, CompuServe, Internet, and MCI users. No gateways are yet in place for LAN-based e-mail systems such as QuickMail, however.

The Newton Messaging Card ($229) is an alphanumeric pager, but unlike other such pagers, it has no display. It can receive alphanumeric pages regardless of whether it's inserted in the Newton or not. When you insert it, you can read its messages on the Newton's screen and save them to the Notepad. Apple's Wireless Messaging Service, a joint effort with BellSouth's MobileComm, is available for $21 to $84 per month, depending on the extent of coverage (from local to national). You can also rent a Messaging Card and subscribe to the messaging service for $35 to $100 per month.

Both NewtonMail and Apple's Wireless Messaging Service have plans to expand their offerings in the coming months, as part of Apple's move to a more extensive online service that will eventually incorporate AppleLink as well. Look for such features as news headlines, sports scores, weather reports, and stock prices.

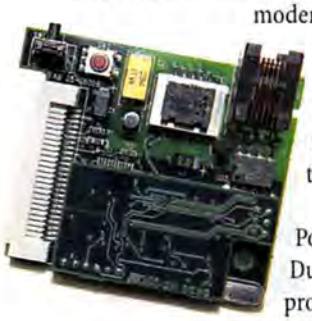
Newton Connection Kit will get a face-lift to 2.0. The new version ($149, free to registered 1.0 owners) will open the gates for data exchange between Mac-based personal-information applications (address books, calendars, and so forth) and the Newton's internal database of names and dates. Connection Kit 2.0 will ship with, at a minimum, translators for Address Book Plus, DateBook Pro, Dynodex, Lotus 1-2-3, and Now Up-to-Date. Synchronization of these apps with the Newton's will still be somewhat limited, however, until Mac-application vendors implement special record-tracking fields that will ensure that even if a user edits data on both the Mac and the Newton, only a single, up-to-date copy of the information will be stored.

Things to watch for: This spring or summer, expect to see Newton-based "smart phones" and tablet-sized Newtons, from a variety of vendors, including Apple.

HOT PRODUCT /

A BETTER DUO MODEM

ONE REASON the PowerBook Duo series got off to a slow start was the poor performance of Apple's Express Modem, until now the only modem available for the Duos. Global Village Communication, known for its popular line of PowerBook modems, expects to be shipping a $399 PowerPort modem for the PowerBook Duo by the time you read this.



Unlike the Apple Express Modem, the PowerPort/Duo modem doesn't rely on the Duo's 68030 for processing horsepower to provide compression and error correction — the PowerPort/Duo's AT&T chip set takes care of all that. Also unlike the Express Modem, the PowerPort/Duo supports the V.32terbo specification, originated by AT&T to provide data-transfer speeds as high as 19,200 bps and fax speeds of 14,400 bps.

V.32terbo is an interim step toward the V.34 standard, also known as V.Fast, which ultimately should provide 28,800-bps connections and should be approved later this year. Numerous vendors have pledged to support V.32terbo in the interim.

Duo owners who love to fax will be pleased to learn that the PowerPort/Duo should also be able to support faxing at 14,400 bps, in contrast to the Express Modem's speed of 9,600 bps. At press time, however, Global Village still wasn't 100-percent sure that the faster fax speed would be achieved. 800-736-4821 or 415-390-8200. / Stephan Somogyi

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From Peter Norton, the leader in Macintosh utilities.

To learn more, dial FAST FAX 1-800-554-4403 and select option 1, document 411. (For information on easy network installation, choose option 1, document 481.) Better yet, pick up Norton Utilities at your local dealer for about $149.*

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PowerBook Tips

From creating sleep corners to organizing your RAM disk, these tips from experienced PowerBook users will keep you on the move. BY JOSEPH O. HOLMES

Key Shortcuts

Here's how to create a sleep corner on your PowerBook's screen: First assign an Fkey to activate your PowerBook's Sleep mode (you can use Fifth Generation's Suitcase II, ALSoft's MasterJuggler, or Apple's ResEdit). Next install ClicKey, a freeware extension that's available through on-line services such as ZiffNet/Mac (filename CLIKEY.SIT, in Library 3 of the Download & Support Forum). ClicKey triggers any assigned Fkey when you click in a designated corner of your screen. Configure ClicKey to trigger the Fkey, drag it to your Extensions folder, and restart. Now to put your PowerBook to sleep, just click in the designated corner of your screen. ClicKey can trigger as many as four Fkeys.

Tim Holmes
Berkeley, CA

Lost and Found

When you travel with your PowerBook, tape your business card to your AC adapter. That way, if you accidentally leave your adapter behind in a hotel room, the hotel can locate you to return it.

Diane Roback
Brooklyn, NY

Write to PowerBook Tips

c/o *MacUser*
950 Tower Lane
18th Floor
Foster City, CA 94404

You can also send your tip to Joseph Holmes (72241,731) on ZiffNet/Mac, *MacUser*'s on-line service. We pay $25 for every undocumented tip we print, and the Tip of the Month earns $100; see page 4 for more details.

PowerBook 100s and Floppy-Disk Drives

If you're tired of having to shut down your PowerBook 100 before connecting an external floppy-disk drive, this tip's for you: Connect the floppy drive, and boot your PowerBook. Then eject the floppy disk, if one is in the drive; activate your PowerBook's Sleep mode; and unplug the floppy drive. The PowerBook will think the floppy drive is still attached. Whenever you need to write to or read a floppy disk, simply activate Sleep mode, plug in the drive, and wake up the PowerBook. Be sure to eject the floppy disk before activating Sleep mode and unplugging the drive. If you don't, the system will try to find the mounted but missing disk.

Nick Michelli
Upper Montclair, NJ

RAM Disk

If you keep your System Folder and applications on a RAM disk, you probably find that the hard disk still spins up occasionally for no apparent reason. To put an end to that nuisance, make an alias of the hard disk and keep it on your RAM disk. Then unmount the hard disk by dragging it to the Trash. Now the disk won't spin up for any reason. Instead of using SCSI Probe or another utility to mount the hard disk, you can double-click on the alias.

Paul Huddle and Bob Curlee
Pasadena, CA

Battery

If you ever run your PowerBook down to the last ten-second warning, put it to sleep for five or ten minutes. Wake it up (be sure to turn off the backlighting), and the battery will yield approximately two more minutes — time enough to save a file. This trick works, but don't bet an important file on it.

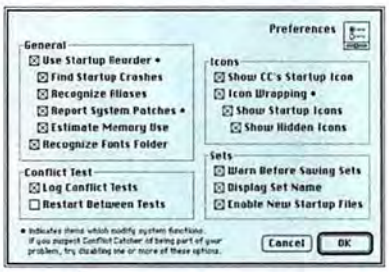
Steve Taylor
via ZiffNet/Mac

TIP OF THE MONTH

Conflict Catcher II

Conflict Catcher II has a feature for PowerBook users who boot off a RAM disk. You can create aliases of most of your control panels and extensions and place the aliases, instead of the originals, in the Control Panels and Extensions folders on the RAM disk. Just make sure Recognize Aliases is checked in the Preferences dialog box. This can save a lot of space on your RAM disk, and you can allot more RAM to applications. The only control panel I know of that doesn't load when you click on its alias is Now Software's Super Boomerang (part of Now Utilities). Also be aware that the hard disk spins up more frequently whenever an aliased control panel or extension reads from its file.

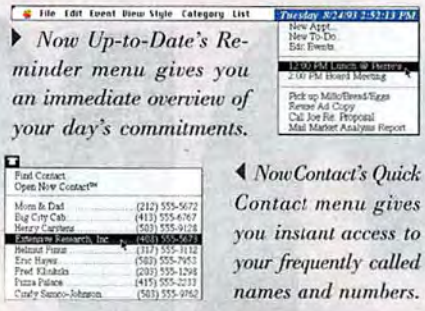
Adam C. Engst
Renton, WA



CompuServe

Here's how you can program CompuServe Information Manager (CIM) to dial up CompuServe when you're on the road. Once you've created all the session settings, including the CompuServe access phone number for a place you'll be visiting, quit CIM and find the CIM Prefs file, in the CompuServe folder in the Preferences folder. Give the settings file a name that indicates where you can use it (CIM New York 9600, for example). Then drag it to a convenient area in your PowerBook. Double-click on the file to launch CIM with the local phone number.

Martin Fenner
via ZiffNet/Mac



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CIRCLE **117** ON READER SERVICE CARD

Prints of the Road

Portable computing isn't just processing power — sometimes it's printed pages too. But how do you handle printing when you're on the road?

BY SHARON ZARDETTO AKER

NOT SO LONG AGO, I had to ship my Mac Plus and ImageWriter to Disney World a few days before my departure so I could do some work during my vacation. Things are a lot easier now: I occasionally vacation without my kids, and my PowerBook doesn't have to be shipped ahead. Neither does a printer — there are models lightweight enough to carry right along with your luggage.

Although this is not a review of portable printers, during my research for this article, I looked at several of them, including the Kodak Diconix, GCC WriteMove II, Hewlett-Packard DeskJet Portable and DeskWriter 310, Mannesmann Tally MobileWriter, and Canon BJ10-sx.

Buying Considerations

Before rushing out and buying the most lightweight or least expensive or fastest portable printer, you must consider physical and performance specs you wouldn't even look at if you were buying a stationary printer. The importance of each spec — whether it's price, weight, output, or battery life — varies with each user. Here are some of the more important considerations:

Price. Most portable printers are priced between $300 and $500, the $1,000 PostScript MobileWriter from Mannesmann Tally being in a class by itself. But when considering price, calculate the price per page, which includes the cost of a ribbon. One portable-printing technology, thermal fusion, uses thermal-transfer ribbons with short life spans. You might get as few as 20 pages from one ribbon if you're printing high-resolution graphics.

Weight. The combined weight of a PowerBook and a portable printer is less than the weight of the Macintosh Portable. Still, demand for even-more-lightweight products continues. Of course, weight may not be an issue for you at all. Maybe you need a printer in your hotel room to print reports for a meeting the next day, or you're spending the day at a client's office and need to print some documents, or you're visiting a dozen sites a day and need to print at each one. Depending on your situation, weight may or may not matter.

However, if weight *is* an overriding issue, remember that the printer's weight doesn't tell the whole story. Your printer's AC adapter can account for a few extra pounds. An adapter can be anything from a three-quarter-pound brick, such as the one used by the WriteMove II, to a two-pound cinder block, such as the one supplied with the DeskJet Portable. Then there are additional sheet feeders that can turn your portable printer into a deep-sea anchor.

Output. If you need color or PostScript output, your choices are limited. Special needs aside, you should consider output quality. Once again, your choice of resolution is determined by your needs. If you're printing contracts, you'll need a nonsmearing, high-resolution printer to handle the fine print. If you're submitting an initial estimate for a job or taking the minutes of a meeting, lower resolution and semipermanent ink may be adequate. Resolution options vary widely. Of the printers I looked at, the Diconix had the lowest resolution, 192 dpi in normal mode and 96 dpi in draft mode. Most of the other printers print 300 dpi, and the WriteMove II is capable of 360 dpi.

POWERBOOK SECRETS / *data recovery*

DESPITE ALL THE ADVICE and against your better judgment, you didn't back up your PowerBook's hard disk. You boot up and see only the flashing disk icon, and an assortment of data-recovery utilities can't even find the disk. Don't panic. At least not yet.

Consider your PowerBook's hard drive a separate device. So even if the PowerBook is broken beyond repair, you may be able to remove the hard drive and install it inside another PowerBook to recover your data.

When you've reached the limits of your ingenuity, data-recovery companies such as DriveSavers, of Novato, California (415-883-4232), can rescue your data, even when your PowerBook seems irreparable. In one case, DriveSavers was able to recover important data from a PowerBook that had been dropped into the Amazon River, by taking the hard drive apart, separating and cleaning the platters, and cleaning the drive's mechanism.

Of course, the best insurance is always to keep a current backup. But if you forget and your disk contains data you cannot afford to lose, data-recovery firms can probably retrieve your data and repair your drive in the process. You'll spend $125 to $350, a small price to pay to recover years of important work. Turnaround times vary from 24 hours to 5 days.

Other data-recovery services include Data Recovery/Disk Repair (415-306-1100), Ontrack (800-752-7557 or 714-263-9245), and Computer Shoppe (619-384-4500). / Rich Wolfson

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CIRCLE 10 ON READER SERVICE CARD

Here's what Sharon Aker packs when she takes a portable printer on the road: A GCC WriteMove II, along with an extra ribbon and battery and some paper.

Some inkjet printouts are slightly blurry, because the sprayed ink wicks a little on the paper; most printouts smear when the page gets wet. Printers such as the WriteMove II and MobileWriter feature thermal fusion, using special ribbons to print on standard paper. This alternative produces higher-quality output at a higher cost.

Battery life. If you print at night back at the hotel or on-site in a client's office, an outlet is probably available. In the field, you'll need a battery. There's a direct correlation between a printer's weight and the longevity of the battery. The WriteMove II weighs 2 pounds and prints 15 pages on a single charge, the BJ10-sx weighs 4.25 pounds and prints 40 pages, and the MobileWriter weighs 8.4 pounds and churns out 150 pages.

Still More Considerations

Once you've selected your ideal printer, there are other things to consider:

- How much does the paper weigh? If you can't get supplies at your destination, figure on a couple extra pounds for a few hundred sheets. Also, ribbons and ink cartridges are good for only a limited number of pages, so pack extra. They're particularly difficult to find, even at computer stores. If you're exceeding your carry-on limit, remember, you can ship stuff ahead before departure.
- Finally, if you use your PowerBook to print at your home or office and also on the road, you're likely to be switching from a PostScript-capable printer to a portable one that's not. If you don't want to reformat your documents, stick with fonts that are available in both TrueType and PostScript versions. Or you may want to install ATM on your PowerBook (ATM interprets PostScript fonts for both your screen and a non-PostScript printer).

Other People's Printers

Maybe you don't need your own printer on the road, because you'll be visiting offices that have computers and printers. But don't assume that if Macs are available, they will be fully equipped with everything you need in order to print your documents.

- Make sure you have a way to connect your PowerBook directly to a printer. An ImageWriter cable — with round DIN connectors on each end — lets you connect to an ImageWriter, a StyleWriter, or even a networkable LaserWriter. Two PhoneNet connectors and a length of phone wire are equivalent to an ImageWriter cable and also give you the capability of plugging in to a network. Farallon's StarConnector is compact and has built-in termination, but it can't be connected in the middle of a SCSI chain.
- Don't forget software: You can't use the LaserWriter driver to print to a StyleWriter. You can always get the driver software from a Mac at the site, but you need a network connection, SCSI-disk mode capability (and SCSI cable), or a floppy-disk drive on your PowerBook.
- If you're visiting a hostile (non-Mac) environment, PowerPrint, from GDT Softworks (800-663-6222 or 604-291-9121), is the perfect all-around solution. It includes a cable for connecting your PowerBook to any "foreign" printer and a disk containing drivers that cover almost any eventuality.

Just the Fax, Ma'am

If there's simply no printer to be found anywhere, don't forget that your PowerBook, with its internal modem, can double as a fax machine. Use the hotel fax machine or one at a copy/fax center in the area. Nothing like that around? Try begging politely at some local travel agencies — they are generally easy to find, and the people are eager to please. I tried a local travel agency just as a test for this column; they thought I was a little nuts, but harmless, and agreed to my request.

Sharon Zardetto Aker and Rich Wolfson are the coauthors of the second edition of *The PowerBook Companion*.

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In closing, we just want to remind you that your competition is also reading this ad. And they're extremely hungry. So when choosing a presentation printer, the choice is quite simple. You can either eat, or be eaten. Bon appétit. **Tektronix**

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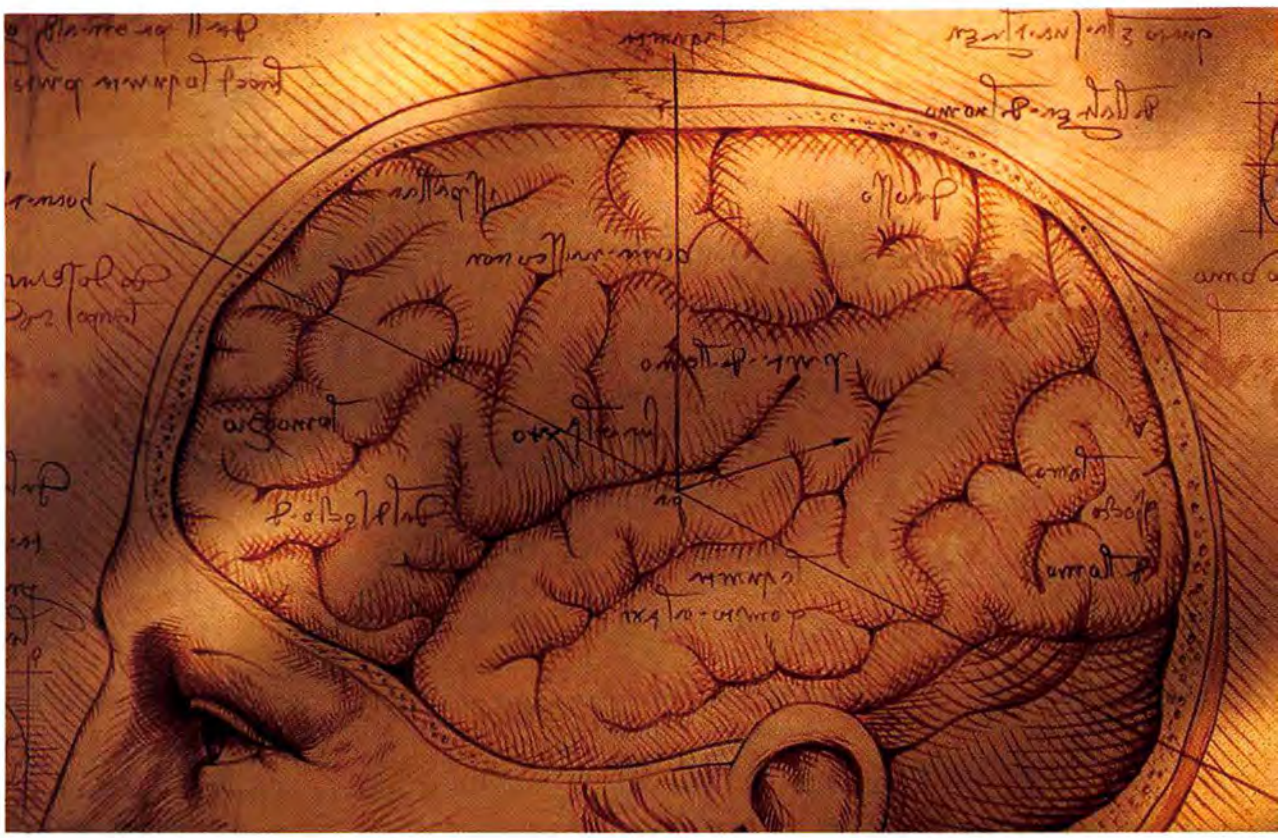
CIRCLE **122** ON READER SERVICE CARD



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CIRCLE **81** ON READER SERVICE CARD

PHOTOGRAPHY / SCOTT PETERSON

The Newton Shuffle

IF YOU BUY A NEWTON, these time- and money-saving suggestions will help you get data to and from your Mac. BY DANNY GOODMAN

Go ahead, buy a Newton. Apple's palm-sized PDA (personal digital assistant) is ideal for storing notes and contact information, and the underlying technology has a lot of possibilities. But be forewarned: Sooner or later, you're going to have to transfer information to or from your desktop Mac, and that is not easy. The obvious tool for transferring data is Apple's Newton Connection Kit 1.0 ($149), but early users soon found that it couldn't successfully transfer years of accumulated address-book and other reference data to the Newton. Even version 2.0 of Connection Kit, which should be available soon, is not going to solve all of your problems. Here are some tips for making the Mac/Newton data shuffle a little easier:

First, you must decide how you're going to use your Newton. PDA users tend to be either PDA-centric or desktop-computer-centric, and each style begs for a different approach.

PDA-centric users depend on the data stored in the PDA. The desktop Mac, although perhaps used for other chores, is a peripheral to the PDA and is used primarily for backup — storing a snapshot of the PDA's contents for restoration in the event of a catastrophe. PDA-centrics may also choose to use a desktop Macintosh to enter data if they want to avoid wrestling with handwriting recognition of strange names.

In the other camp, the desktop-computer centrics' lives revolve around data stored on a hard disk. For these people, the PDA is a peripheral to the desktop Mac. Information may need to be synced daily between desktop and PDA or periodically dumped from desktop to PDA for occasional excursions.

Newton Connection Kit 1.0 is a PDA-centric application. Beyond taking care of the important function of loading Macintosh-file-based Newton programs (called *packages*) into the Newton, Connection Kit establishes a virtual Newton in a file on your Mac. You edit this file's contents on the Mac by using the Connection Kit software. When you next sync your virtual and real Newtons, the software knows which information has been deleted from and added to each Newton and synchronizes their contents, based on each entry's most recent modification date.

To the dismay of desktop-centric users who have data in PIMs and databases, Connection Kit 1.0 offers no automatic way of getting that data into the virtual Newton for transfer to the real one. The only answer is to look beyond Apple for products that can help you transfer your data. Luckily, such products exist; even better, they're often much cheaper than Apple's software.

Cheap Solutions

Freeware and shareware aids have appeared on on-line services such as CompuServe, America Online, and *MacUser*'s ZiffNet/Mac. Newton Transfer, a QuicKeys macro written by Ben Sharp (on ZiffNet/Mac, look for filename NTRANS.SIT in Library 16 of the Download & Support Forum), automates the copying and pasting of data from Portfolio's Dynodex PIM to Connection Kit, field by field, one record at a time. You can also record your own macro with CE Software's QuicKeys or Affinity's Tempo II Plus. First create a macro that records the steps for copying and pasting each field of one complete record from the PIM or database to Connection Kit, and then go to each record you want to transfer and run the macro.

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CIRCLE 42 ON READER SERVICE CARD

Repetitious, yes, but easier than retyping each record.

My own solution to the problem of transferring data skirts Newton Connection Kit entirely. Newton Names & Notes Downloader (NNND) is a free HyperCard 2.1 stack (filename NNND.SIT in Library 16 of the Download & Support Forum) that takes advantage of the Sharp application that comes in the Newton's Extras drawer. This application allows one-way data transfer from a Sharp Wizard PDA to the Newton (see figure 1). NNND tricks the Newton into thinking it's getting a download from a Wizard. (You need an ImageWriter cable or a serial cable such as the one included with Connection Kit to connect your Mac and Newton.)

Unfortunately, Sharp Wizard phone directories are far less structured than the

figure 1 / **Newton Names & Notes Downloader** is a free HyperCard stack that lets you transfer the contents of your electronic address book to your Newton.

Newton's. For example, Wizards have just one field into which the user enters all the parts of an address — street, city, state, postal code, and country. The Newton prefers that each of these items be in a separate field, so the Sharp application lumps all address data into the first Address field of the Newton's Names file.

Here's how to remedy the problem: The ellipsis you see at the end of the Newton editing line indicates a carriage return. To remove it and bring up the next line, double-tap the ellipsis to display the keyboard, tap the right-arrow button, tap the delete button, and then tap the space bar.

You can now select and drag the next line of data to the Clipboard (any screen edge), open the desired field, and drag the text to the field. Repeat these steps for each line of data in the Address field.

Beyond Connection Kit 2.0

By the time you read this, there may already be several additional transfer possibilities — both shareware and commercial — that bypass Connection Kit (although you'll still need Connection Kit to download the software parts of these transfer packages to the Newton and to back up to the Mac).

Newton Connection Kit 2.0 will provide transfers not only for tab-delimited files but also for several popular Mac file formats (and for PC formats for the Windows version). Connection Kit 2.0 will use enhanced DataViz translators to convert data directly to and from several Microsoft program formats as well as the formats of Dynodex, Aldus' DateBook, PowerUp Software's Address Book Plus, Now Software's Now Up-to-Date, and Lotus Development's Lotus 1-2-3 (but curiously, it won't convert to and from Claris' FileMaker Pro or ClarisWorks formats). Note, however, that transferring converted data just means doing a data dump — it cannot merge or update existing records on either side of the cable. Such data dumps are best for a single, initial transfer rather than periodic updates.

To merge desktop data intelligently into the virtual Newton, Connection Kit 2.0 will require that the data be stored in a specially formatted intermediate file. The format includes critical information about data items (unique IDs and modification dates) that makes synchronization possible. Contact your database- or PIM-software vendor about its plans to support this file format for data synchronization. Adding this support is not easy for vendors, so be patient.

It looks as though we'll have to wait even longer for a version of Newton Connection Kit that includes support for Apple events and AppleScript. These facilities will let desktop applications move data directly to and from the virtual Newton and synchronize it in Connection Kit without users having to mess with the intermediate file. That's a key step in making Connection Kit more desktop-centric.

There may never be a single program that covers every way of integrating a PDA into our computing lives. But that's a consequence of the *personal* in *PDA*.

Danny Goodman is the author of *The Complete HyperCard 2.2 Handbook* and *The Complete AppleScript Handbook*.

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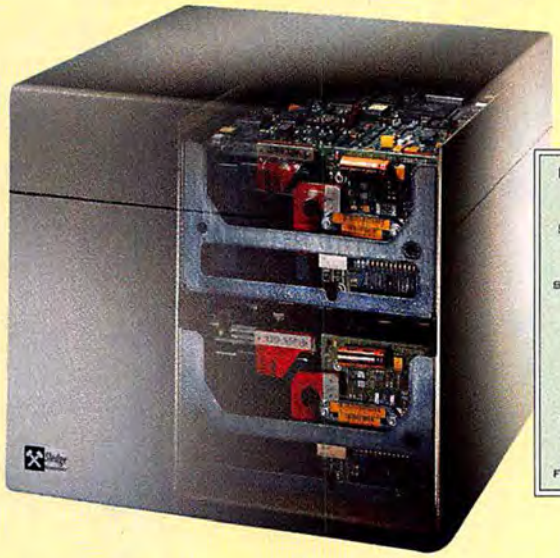

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Upgrading Apple LaserWriters

Installing more memory in your printer lets you print faster and take advantage of Apple's PhotoGrade technology, and it may not cost you a cent. BY TOM PETACCIA

INCREASING THE AMOUNT of RAM in your printer speeds up printing, lets you use more fonts in a document, and can also make your Mac faster. Like a Mac, a PostScript laser printer uses RAM to process information. The printer's RAM handles downloadable fonts, and it *buffers,* or stores, printing instructions sent from your Mac. The more RAM your printer has, the more information can be buffered, so jobs print faster and you regain full control of your Mac sooner.

You might not have to spend any money to increase the memory in your Apple LaserWriter. If you've upgraded the RAM SIMMs inside your Mac, you may be able to transfer the old SIMMs to your printer. Sixty-four-pin SIMMs from the IIfx can be transferred to the LaserWriter IINTX; 72-pin SIMMs from the LCIII and the Quadra 610, 660AV, 800, or 840AV work in the LaserWriter Pro 600/630 and the LaserWriter Select 360; and 30-pin SIMMs from Mac models such as the IIci work in the LaserWriter IIf and IIg.

Another option is to purchase RAM from a vendor such as The Chip Merchant (800-426-6375 or 619-268-4774) or Technology Works (800-765-9864 or 512-794-8533). Check with vendors for current prices, which change frequently. (At press time, a 1-megabyte SIMM cost around $40.)

The cost of increasing RAM depends on the type of printer and the complexity of documents you print. You don't need to upgrade at all if you print only simple word-processing documents.

The LaserWriter IINT comes with only 2 megabytes of RAM, and the only way to add more is to get a controller-board upgrade. The Accel-A-Writer board ($995), from Xante (800-926-8839 or 205-476-8189), has 8 megabytes of RAM and upgrades the IINT to a 600-dpi RISC-based printer, yielding significantly faster processing speeds. Upgrade boards from Apple transform the IINT into a IIf with 4 megabytes of RAM ($1,015) or a IIg with 8 megabytes of RAM ($1,455). However, considering the low cost of the recently introduced LaserWriter Select 360 (around $1,600), which has 7 megabytes of RAM, buying a new printer might be the best option.

The LaserWriter IINTX, IIf, and IIg have the same *form factor,* or basic design, but they take different types of RAM in different configurations. The IINTX comes with 2 megabytes and is upgradable to a maximum of 12 megabytes. The IIf and IIg come with 2 to 8 megabytes. You need at least 8 megabytes to take advantage of Apple's PhotoGrade technology, which gives you photo-realistic images.

The LaserWriter Pro 600 and 630 come with 8 megabytes of RAM each, but you may need more if your documents have many fonts.

How to install RAM

Installing RAM in a LaserWriter IINTX, IIf, or IIg is simple. Remove the two Phillips-head screws on the printer, near the ports.

Ground yourself, and slide the logic board out.

Add or replace the RAM SIMMs, slide the board back in, and put the screws back.

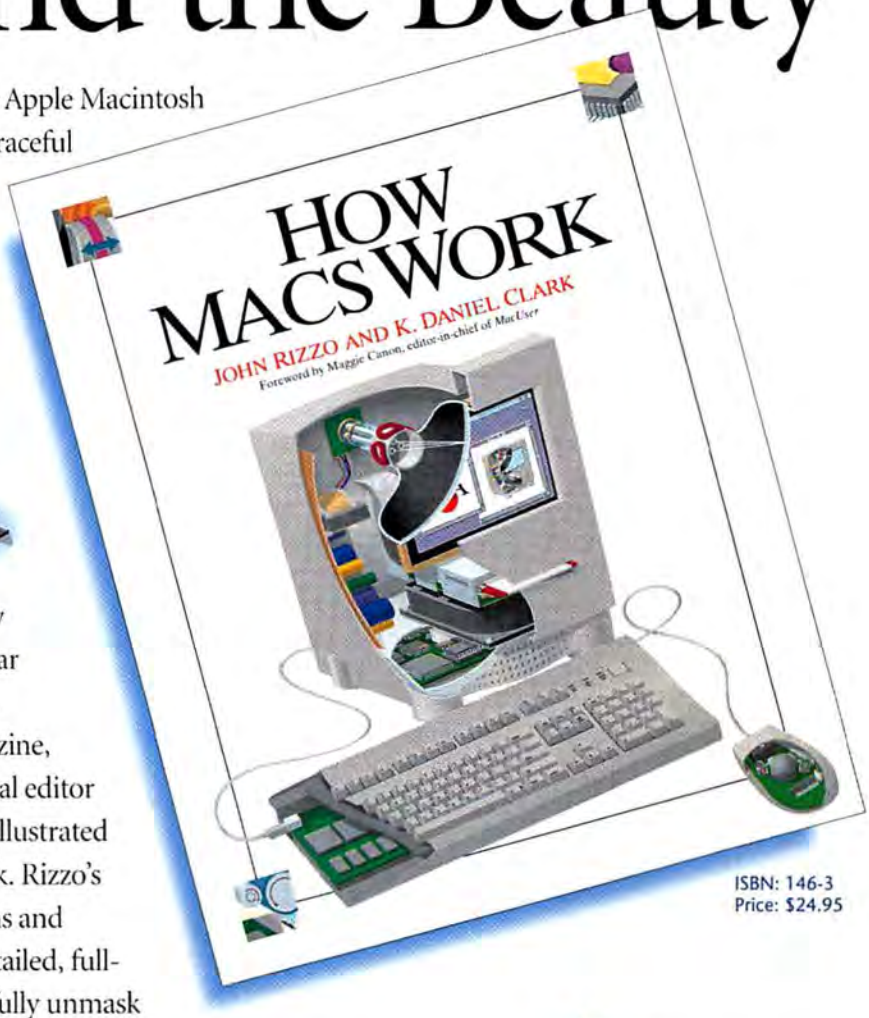
INSIDE INFORMATION / *the LaserWriter*

Transferring RAM SIMMs

If you're lucky enough to have recently upgraded the RAM in a Macintosh Classic II; Color Classic; LC; LCII; IIsi; IIci; IIvi; IIvx; or Quadra 700, 900, or 950 and have leftover SIMMs to recycle, you can transfer the old RAM to a LaserWriter IIf or IIg. As long as a RAM SIMM has 30 pins and is rated at 100 nanoseconds or more, it'll work in the LaserWriter IIf and IIg. These printers can take a maximum of 32 megabytes of RAM, which can cost $1,000 or more. It's unlikely that you'll ever need that much RAM. With a 300-dpi printer, you need at least 5 megabytes for complicated graphics and for documents with multiple fonts.

Meet the Brains Behind the Beauty

To the outside world, the Apple Macintosh presents the world's most graceful computing environment. But on the inside, the Mac is layer after layer of stunningly intricate technology and design. If you've ever wondered how it all fits together, read *How Macs Work*, an all-new book inspired by the popular "How It Works" series that appeared in *MacUser* magazine, written by *MacUser* technical editor John Rizzo, and brilliantly illustrated by K. Daniel Clark. Rizzo's lucid explanations and Clark's highly detailed, full-color illustrations artfully unmask and demystify the inner workings of the Macintosh. What happens to data on the way from memory to storage? How does the closely guarded Mac ROM chip give the Mac its unique look and feel? How do technologies mesh to form the Mac's built-in networking features? If you've ever wondered what makes a Mac a Mac, turn to *How Macs Work*.



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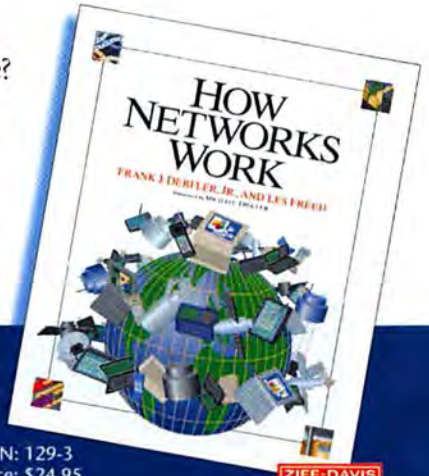

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Tip Sheet

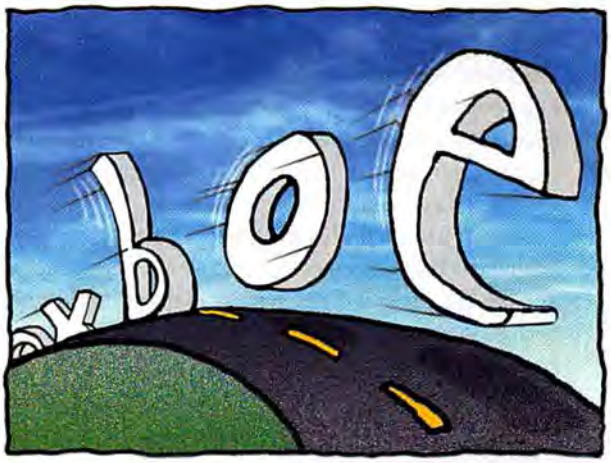
From better font management and database design to faster printing and finding, our expert and user tips show you the shortcuts. BY PHILLIP RUSSELL

ATM IS GREAT, but if you want your programs to process images faster and you have the hard-disk space, you should install every size of every font you use. That way, ATM doesn't have to take extra time to draw the sizes resident in your Mac.

TO ZOOM IN to a precise point in MacDraw II or MacDraw Pro, click on the spot and then press Command–right-arrow. To zoom back out again, press Command–left-arrow. (Thanks, ClubMac of Monterey, CA.)

DON'T RESTART your laser printer while your Mac is processing a print job. Some programs don't take kindly to being interrupted this way. If you must restart your printer in midprocess, cancel the print job in PrintMonitor first.

IF AN APPLICATION MALFUNCTIONS, reinstall it. If it continues to malfunction, try replacing the application's preferences file — it may be corrupted. With PageMaker, for example, replacing the RSRC file, located in the Aldus folder, in the System Folder, may do the trick.



ADOBE ILLUSTRATOR 5.0 lets you work on an image in Preview mode. Earlier versions of Illustrator don't offer this option, but you can get around that shortcoming. Here's how: With your illustration open, choose New Window, on the Window menu. Select Preview Illustration for the new window. Arrange the original illustration's window, in Artwork Only mode, and the new window so you can see them simultaneously. You are now able to work in the Artwork Only window and see the changes occur in real time in your new window.

IF YOUR PRINTER IS SET to 300 dpi, you should use fonts that reproduce well at lower resolutions. In my experience, serif fonts that look good at low resolutions include Stone Serif, Trump Medieval, Century Expanded, Centennial, Corona, Excelsior, Impressum, and Melior. In the sans serif category, I like the following: Helvetica, Franklin Gothic, Gill Sans, Frutiger, Stone Sans, and Univers. Other fonts that look good are Hiroshige, Post Antiqua, and Zapf International. Most of these fonts are sold by Adobe.

A quick way to see whether fonts will look good at low resolutions is to look for those with lowercase *g*'s and *e*'s that don't plug up with toner when printed at small point sizes. It's a safe bet that other characters in these fonts will print well at low resolution too.

Write to Tip Sheet

c/o *MacUser*
950 Tower Lane
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Foster City, CA 94404
You can also send your tip to Gregory Wasson (72511,36) on ZiffNet/Mac, *MacUser*'s on-line service. We pay $25 for every undocumented tip we print, and the Tip of the Month earns $100; see page 4 for more details.

READER TIPS / *compiled by Gregory Wasson*

Floppy Disks

To copy a file from a floppy disk to your Mac's desktop, lock the floppy disk first and then drag the file from the floppy disk to your desktop. A dialog box will ask if you want to copy the file to the startup disk. Click on OK, and the file will be copied to the desktop. If you don't lock the floppy disk first, the file will be placed on the floppy disk's desktop but will disappear when you eject the disk.

Christopher Stookey
Minneapolis, MN

Picture Compressor

To shrink a graphic such as a screen shot for e-mail transfer, you can use Picture Compressor, a utility on Apple's QuickTime utilities disk. Here's how:

Save the drawing as a PICT file, and then open it, using Picture Compressor. Press Command-A (Select All), followed by Command-C (Copy) and then by Command-V (Paste). The number in the upper right corner of the window, which represents the file's size, will be much smaller for this new file than it was for the original graphic. Once your file is compressed and saved, you can use a draw program to reopen it.

Warning: Picture Compressor "flattens" the PICT file into its visible components, so a group of elements becomes a single element. Also, if you use Picture Compressor's Compress command (Command-K), you create a file that you can open only by using QuickTime.

Craig O'Donnell
Somerville, MA

ClarisWorks

To automatically convert a row of numbers in ClarisWorks (for example, 4165551234) into telephone-number format so it appears as (416) 555-1234, follow these steps:

Create two database fields in this order: Number Entry (a number or text field) and Phone Number (a calculation field). When you create the calculation field, a dialog box appears and prompts you for a formula. Enter the following formula exactly as shown:

```
"("&MID('Number Entry',1,3)&")"&MID('Number Entry',4,3)
&"-"&MID('Number Entry',6,4)
```

Set your format to Text in the Format Result As menu in the dialog box. Then, in Layout view, select the Phone Number field and give it a solid background. Finally, drag the Phone Number field over the Number Entry field and delete the Number Entry label, replacing it with the Phone Number label.

When you tab to the hidden Number Entry field, it pops up from behind the Phone Number field and allows you to enter any phone number as a string of digits. Tabbing to the next field automatically formats the number as a phone number.

Pavel Pochobradsky
Toronto, ON, Canada

Put Away Command

To return a file on your desktop to its original location inside a folder, all you need to do is select the file and press Command-Y, the Put Away command. The file will automatically return to its original location. You can also use this command to eject selected floppies.

Dan Rosellini
Phoenix, AZ

TIP OF THE MONTH

System 7.1 Finder

In System 7.1, you don't need to drag groups of files into the closed System Folder in order to have the system put them all in their correct places.

You can drag a folder's worth of files into the closed System Folder, and the system will take them out of the folder and put them in the correct spots.

Sara Bennett
Brooklyn, NY

Excel 4.0

Our September '93 tip for adding time units in Excel (page 264) contained an error in the code. Here's how the tip should have read:

Do you want Excel to add up the timings on a tape or a CD? Or the total number of hours put in by a part-time worker? Excel won't let you add hours:min or min:sec unless you use the following formula:

```
=TEXT(SUM(INT((SUM(A3:A5)*24))*100)+(MOD((SUM(A3:A5)
*24),1)*60),"#0:00")
```

Replace A3:A5 both times with the appropriate cell ranges from your spreadsheet.

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CIRCLE **125** ON READER SERVICE CARD

Help Folder

How to maximize your Newton's memory, keep your floppy-disk drive dust-free, cut and paste when Microsoft Word doesn't want to, and banish that pesky Caps Lock key. BY ANDY IHNATKO AND BOB LEVITUS

Watching a Fine Line

Q. I was happy with my 14-inch Macintosh Color Display until I noticed a horizontal line of black pixels across the screen. It's not a major problem, but what's wrong?

Jim Tsifakis
Piraeus, Greece

BOB: It's an inherent characteristic of the Sony Trinitron tube, and unfortunately, there's no known way to get rid of it. The line is caused by the horizontal stabilizing wire, which helps keep the electron guns lined up with the grid of wires inside your monitor, ensuring that the correct colors light up on your screen.

The visibility of the black line differs among monitors. If it's really annoying you, see if your dealer will swap your monitor for one with a less visible line.

When Clipboards Go Bad

Q. Recently, I found that when I tried to paste new data into Word (or any other program for that matter), my Mac just wouldn't do it. Nor can I cut and paste from within the Finder, to replace one filename with another, for example.

Any ideas what could be causing this? I've already run Disk First Aid, rebuilt my desktop, and turned off all extensions, but to no avail.

Dan Rahenkamp
via ZiffNet/Mac

ANDY: Well, Dan, you did everything correctly: Each of the steps you mentioned can often solve a Mysterious Problem. But the real culprit is probably a corrupted Clipboard file. This file sits inside the System Folder and is used when the Clipboard is too big to be maintained in memory. Normally it's a productive member of society, but when it's been hosed by Forces Unknown, you'll find that it's impossible to cut and paste between apps. Toss it into the Trash without further ado, and all should be well. A brand-new Clipboard file will be created from scratch the next time you use the Cut command.

Floppy-Drive Dustbusters

Q. Should floppy drives be cleaned? If so, what cleaning method do you recommend?

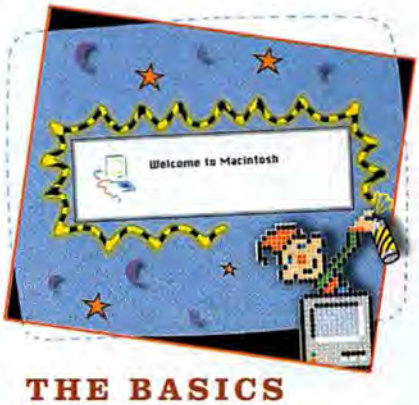
Carmen Sternwood
Los Angeles, CA

BOB: In the old days, Apple recommended taking your drive to a dealer if it needed cleaning, but as of August 1991, it started recommending the use of 3M floppy-drive cleaning kits.

The 3M kit costs around $10; call 800-854-0033 (inside the U.S.) or 612-736-0314 (outside the U.S.) for names of local distributors. Drive Tech ($59.95), from Micromat Computer Systems (415-898-5792), includes a 3M cleaning kit as well as a sophisticated floppy-drive diagnostic program. If it saves you one trip to the dealer, it's worth more than it cost.

ANDY: Whichever head cleaner you buy, you must remember that they're designed to be much more abrasive than a normal floppy, which means that if you embark on an overly aggressive policy of weekly cleanings, your drive heads will probably get clobbered within four months. I clean my heads only when I suspect trouble, such as when my Macintosh refuses to mount a floppy that worked just fine a few minutes ago. Unless someone blows cigar smoke directly into the drive on a daily basis, there's absolutely no reason to clean the heads more than four times a year.

Here's a tip: If you leave a disk partially inserted in the drive, it'll keep most of the dust out while allowing air to circulate. Also, give the drive a good shot of compressed air



THE BASICS

Q. How do I change the Welcome to Macintosh startup screen with a graphic image of my own? No matter what kind of file I put into my Startup Items folder, it never works.

Ken Reynolds
Mastings, KY

Andy: The answer is simple. You must have the right file format with the right name in the right place. Some graphics programs (Canvas, for example) can save an image in the proper Startup file format for you; if you don't have one of these programs, you can create the file by hand with ResEdit. Copy the image you want into the Clipboard, launch ResEdit, create a new file named Startup-Screen, create a new PICT resource, and paste the graphic image in. Then, in the PICT resource's Get Info box, change the file's ID number to 0. Save the file, and drag it into your System Folder. Done.

To fix the image if parts of it get cut off, you need to use a graphics editor that lets you hide its menu bar and tool palettes. Center the image on the screen, hide everything else, and take a screen shot by pressing Command-Shift-3. Then use ResEdit to turn that screen shot into your startup screen.

Write to Help Folder

c/o *MacUser*
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Don't want to wait for an answer? Post your question on ZiffNet/Mac, *MacUser*'s on-line service, and get a reply from Bob (76004,2076), Andy (72511,204), or one of the other *MacUser* experts.

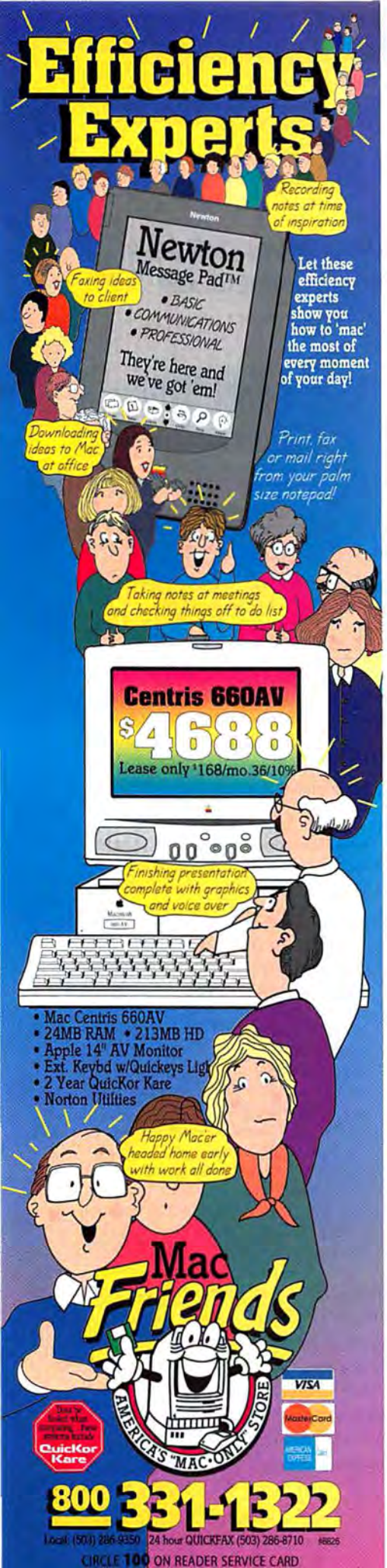

figure 1 / **To keep your Mac's** floppy drive clean and dust-free, try using the Apple-sanctioned 3M cleaning kit; Micromat's Drive Tech utility, which includes the kit; or a can of compressed air for blowing dust out of the drive. Or just keep a floppy disk inserted partway into the drive to keep dust out.

every now and then, preferably with the Mac's top off so that the dust doesn't resettle someplace worse (see figure 1).

More MessagePad Memory

Q. My Newton sometimes tells me I'm running out of memory, but when I check, I find I have lots left. Is this just a misunderstanding, or is it a bug?

Ellen Greuning
via ZiffNet/Mac

ANDY: It's a bug. Your PDA's application memory sometimes gets royally throaked when you do a lot of handwriting recognition. You have plenty of free RAM, sure, but the portion your MessagePad uses to translate pen strokes into letters gets filled beyond capacity. The workaround is simple: Just reset your MessagePad. To do this, you must wait until it's idle, remove the battery cover, and press the reset switch. You won't lose any of your data, and it'll correct your short-term-memory problem.

Them's the breaks of being a pioneer, Ellen. Hey, look on the bright side — at least you have it better than other pioneers, like the Donner party, say, or the first dogs in space. So cheer up, and try this: From the Extras drawer, go to Prefs, select Personal, and write *Graceland* in the Country field. When you restart your MessagePad, the Newton startup light bulb will be replaced by a newt until you change your country name back (see figure 2). And if that doesn't put a spring in your step, write *Find Elvis* in the Notepad, highlight it, and tap Assist.

My thanks to the Boston Computer Society Newton Group and Paul Potts' Newton FAQ (Frequently Asked Questions) for this and other Newton info.

Caps Unlock

Q. The Caps Lock key on my keyboard is a downright nuisance; I often inadvertently hit it when what I really want is the Shift key. How can I disable the Caps Lock key?

Rogier van Bakel
Washington, DC

ANDY: The easy answer is to get a copy of Kevin Hester's free CapsKiller system extension from an on-line service or user group and toss it into your System Folder. Alternatively, you can use a special keyboard-layout file that redefines the Caps Lock key, making it produce lowercase letters. A keyboard-layout file defines which characters and symbols are associated with each key on your keyboard, so you can use one to effectively render any key inoperative.

You can get a new layout file that banishes the Caps Lock key by downloading the archive named Andy's KCHR Hacks from ZiffNet/Mac, *MacUser*'s on-line service, or from other on-line services.

But you want to make your own keyboard-layout file from scratch, using ResEdit, don't you, Rogier? Just follow these steps: Make a *copy* of your System file, and open it with ResEdit. Open the System file's list of KCHR resources, highlight and copy the KCHR named U.S., and paste it into a

figure 2 / **If the troubles** of being a MessagePad pioneer are getting you down, cheer yourself up with the Newton newt. Write *Graceland* in the Country field, restart your MessagePad, relax, and enjoy the show.

new resource file for editing. Double-click on it, and you'll be presented with a layout-editing window. Press the Caps Lock key, and simply drag the lowercase characters down from the "storage bin" in the upper left of the window onto the keyboard representation. When you're done, press Command-I to open the resource's info box and name this new KCHR resource something like U.S. CapsLock Blitz. Now open your current System file from within ResEdit, copy and paste U.S. CapsLock Blitz into the System file's KCHR resources (assigning it a new resource ID if necessary). Quit ResEdit, and you're in business. U.S. CapsLock Blitz now appears in your Keyboard control panel. Whenever U.S. CapsLock Blitz is the active layout, the Caps Lock key will — as promised — be completely ineffective.

Unlike an extension such as CapsKiller, a new layout takes up zero memory, has a less than zero chance of causing a system conflict, and lets you easily switch back to normal operation without having to remove an extension and restart.

Diagnosing Differences

Q. I ran Norton Disk Doctor, because I was having problems with my hard drive. It reported and repaired a problem with my B-tree header. Then I ran Apple's Disk First Aid. It also reported and repaired a B-tree-header problem, but it changed things back to the way they were before. Why do they disagree?

Max11
via America Online

BOB: I'm not convinced they disagree. I suspect they're both trying to fix the same piece of damaged B-tree header but neither fixes it completely. Either way, there is directory damage, which almost always gets worse. The safest way to proceed is to back up your hard disk, reformat it, and restore from your backup — a sure cure for directory damage.

If you have access to other disk-diagnostic programs, such as Central Point Software's MacTools or Fifth Generation Systems' Public Utilities, try them for a third and fourth opinion.

ANDY: Ditto. A volume that has directory damage is like a house full of termites — with every bug you kill, you have to worry about the dozens you can't see. The only solution is reformatting the disk and restoring your data.

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Where Is Zmodem?

Q. Where can I get my hands on the Zmodem File Transfer Tool, a utility that allows you to take advantage of telecom software that uses Apple's Communications Toolbox? When Apple released the Communications Toolbox, there were lots of complaints because Apple didn't provide a tool that supports Zmodem. Everyone said a commercial tool would be available. It's two years later, and I'm still waiting.

John Wymann
via the Internet

ANDY: Unfortunately, to get your hands on spiffy communications tools, you have to apply the same consumer skills you do to selecting kid's cereal — buy a whole box of junk you don't actually want just to get the prize inside the box. But there is a new communications program — SITComm ($120), from Aladdin Systems (408-761-6200) — that's inexpensive and loaded with robust tools. It's a full-featured, entry-level telecommunications program that ships with some kick-butt file-transfer tools for the Comm Toolbox. Its X/Ymodem tools work better with error-checking modems than Apple's standard tool, and its Zmodem tool is better than the three I already had.

Game Reading

Q. Can you recommend a publication that provides info on games and kids' software?

Geary Hughes
Whiteville, NC

BOB: Check out Inside Mac Games (3862 Grace Lane, Glenview, IL 60025), a monthly magazine on-disk devoted to just what you're looking for. It's reasonably priced — $24 a year on high-density disks, $30 a year on double-density disks, and $18 a year via the Internet. If you have a modem, you can get a smaller, shareware version of Inside Mac Games from on-line services such as CompuServe and America Online.

Saved by the Utility

Q. I'm looking for an odd but useful utility: Are there any utilities that automatically record unsaved work?

Julian Wan
Amherst, NY

BOB: Check out NowSave, part of the $149 Now Utilities package, from Now Software (800-237-3611 or 503-274-2800). It can automatically save documents from any application after a time interval, number of keystrokes, or number of mouse clicks you specify. It also includes Key Capture, which continuously records your keystrokes in a text file, so that if you crash, everything you've typed since your last save will be in the text file.

Another program that offers key capture is Thunder 7 ($99.95), from Baseline Publishing (901-682-9676). It's also my favorite spelling checker, thesaurus, and glossary program.

If you want key capture without any extras, get Last Resort ($49.95), from Working Software (408-423-5696).

ANDY: I'll stand by the proletariat as usual and recommend MacLifeInsurance Keysaver. It's shareware that saves all your keystrokes. Considering its piddling $9.95 fee, it's a fabulous value. You can get it from ZiffNet/Mac, other on-line services, or your local user group.

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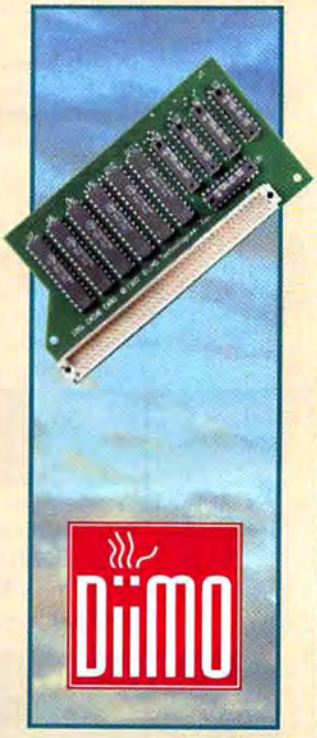

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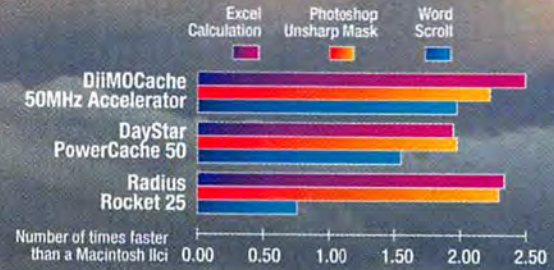

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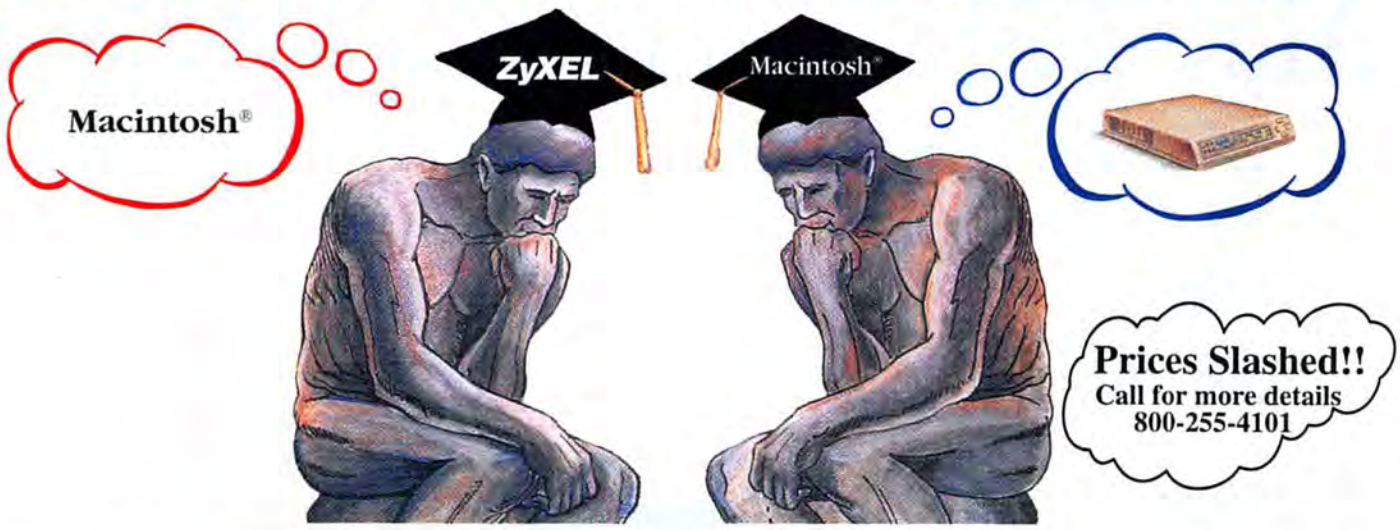

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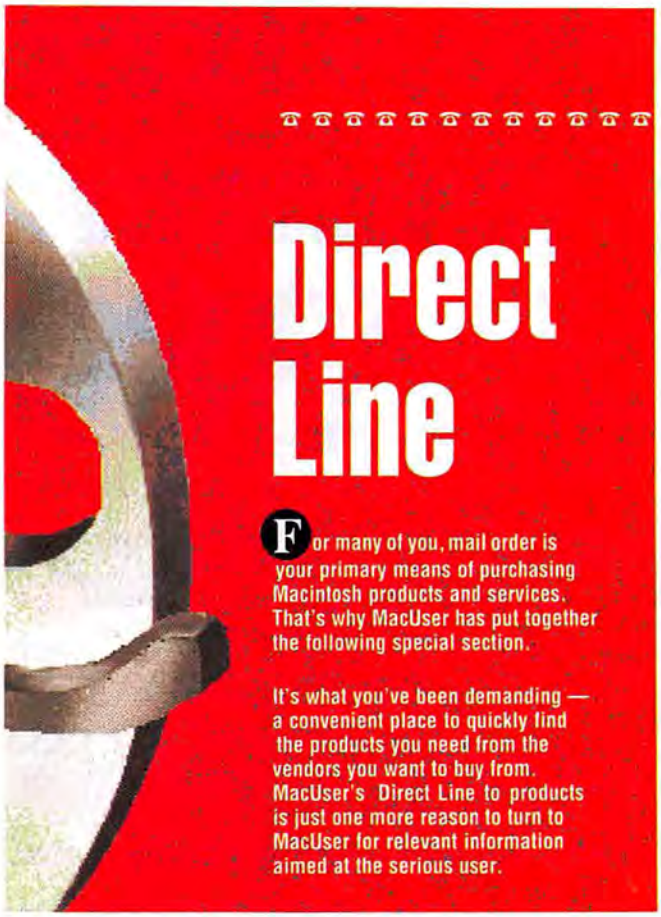

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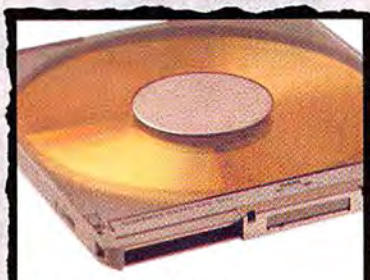

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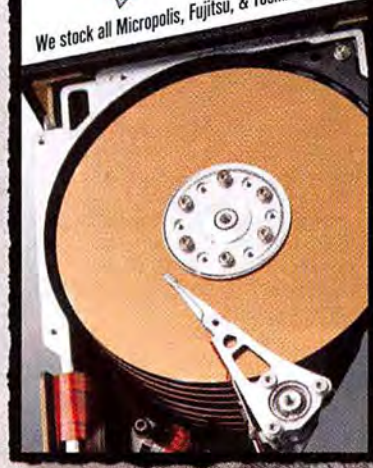

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Two Pack Color	$22.99
DeskWriter 550C	$74.99

Shipping and handling not included.

Colleague Business Software

COLLEAGUE Business Software is business management software that incorporates functions such as appointment calendar; client/prospect file invoicing; job tracking, checkbooks; general ledger; sales,expense, and accounts receivable reports into a single interactive application. Winner of the MacWorld Editor's Choice award and 4 1/2 mice in MacUser (Feb. 1992).

$649.00

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When shopping for an 11x17 PostScript® compatible printer, we realize you have a lot of choices. And while many vendors lay claim to being the best, Xante prefers to leave the judging to you. We invite you to compare our printer with the rest. With the *Accel-a-Writer 8100*, you'll get...

11x17 OverSize Printing - The oversize paper support will give full bleed capabilities on 11" x 17" documents.

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High Speed Printing - The *Accel-a-Writer 8100* is built for speed with the AMD 29030 RISC processor, 12 MB RAM, Xante's *Advanced Memory Management*, and Canon®'s 8 page per minute LBP®-BX laser print engine.

Quality Assurance Guarantee

Flexibility - Sharing among Mac® and PC users is simple with simultaneously active AppleTalk®, Parallel and Serial interfaces. You'll get font flexibility with 35 Type 1 fonts plus the ability to download up to 30 more permanently on the controller with Xante's *Virtual Disk Technology*.

Best Price - The *Accel-a-Writer 8100* gives the highest quality in output, advanced printing technology and flexibility. But the best thing is you won't have to pay a premium. In fact, the *Accel-a-Writer 8100* is only $3,995.

Quality Assurance Guarantee - To protect your investment, Xante provides a one year warranty and full customer support on all our products.

Compare, then call us.

	Accel-a-Writer® 8100	QMS® 860 Print System	NewGen® TurboPS 660 B	CalComp® CCL-600
Standard Resolution (dpi)	600 x 600	600 x 600	600 x 600	600 x 600
Optional Resolution (dpi)	800 x 800, 960 x 960 & 1200 x 1200	None	600 x 1200	None
Standard RAM	12 MB	12 MB	12 MB	16 MB
Virtual Disk Technology	✓			
Enhanced Gray Scale	✓			
Price	$3,995	$4,595	$5,495	$3,995

‡ Optional

Statistics as of 9/93

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Ext. 2209
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Microsoft Office

Act now and save! Through January 31st, Microsoft is offering tremendous rebates on products designed to make your new year in business a great success. Microsoft Office is a great deal – the full versions of the latest Microsoft Word, Excel, PowerPoint, and Mail for over $1,000 less than if you had purchased them separately. These are heavy-duty word-processing, spreadsheet, presentation, and e-mail programs – everything you need for office productivity. These programs were designed to work together, so you can import and export data and graphics from one to another with ease. And they use the same kind of Toolbar commands. Once you're familiar with one program, you're well on your way to knowing them all.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5., a hard disk.

Microsoft

5645 Microsoft Office 3.0 ..... $458.

***After $100 manufacturer's rebate. Rebate expires 1/31/94.**

Microsoft

$274.

WordPerfect 3.0

With WordPerfect's 125,000 word multi-language dictionary and thesaurus, you'll always be able to find that perfect word. But communicating effectively today requires more than just words. QuickTime movies, a powerful drawing package that handles millions of colors, a new Tables feature (with up to 32,000 rows and 32 columns), and an Equation Editor allow you to say *what* you want any *way* you want. Of course, WordPerfect makes it easy with features like Drag 'n' Drop editing. Ruler bars make style and layout formatting simple, Button bars make finding functions quick and easy, and a complete macro language allows the automation of tasks. Includes Grammatik 5 FREE.

Minimum requirements: Mac Plus, 2MB avilable RAM, System 6.0.7, hard drive, 4MB RAM under System 7.

WordPerfect

6681 WordPerfect 3.0 (pictured)

6874 WordPerfect 3.0 Competitive Upgrade ..... $78.

WordPerfect macintosh

$98.

Tempo EZ Tempo II Plus 3.0

Yes, macros make life on the Mac easier, but finding an easy Macro *maker* isn't always – well, easy. With **Tempo EZ**, creating macros is as simple as 1 – Start recording, 2 – Perform the steps, and 3 – Save. That's it. You simply combine keystrokes and/or mouse clicks into one macro. Then, a keystroke, a click, or a couple of characters – that's all it takes to play a macro. For more macro-making power, get **Tempo II Plus 3.0.** It offers the highest degree of automation and even sets up conditional testing. You can create "interactive" macros to determine when to back-up your database, which files to batch-process, how to format a document, and much more.

Minimum requirements: Mac Plus, 1MB RAM, System 6.2

Affinity

6910 Tempo EZ ..... $48.

6534 Tempo II Plus 3.0 ..... $98.

$224.

New!

Arrange

Arrange is a *fully*-integrated Personal Information Manager that lets you organize contacts, schedules, to-do lists, projects, files, and much more. A powerful "drag-and-drop" interface, intelligent importing, and automatic merging and sorting make it quick and easy to use. A library of professional templates is available, or customize your own for totally personal solutions. If you use large databases, you'll appreciate the Smart import which simplifies information access. The Grabber system extension lets you quickly gather just the on-line information you need. Automatic file synchronization simplifies home, office, and mobile information management. And it maximizes your PowerBook's performance with a Sleep feature and RAM optimization.

Minimum requirements: Mac II, 2MB RAM, System 6.0.7, hard drive.

Common Knowledge

7215 Arrange

$235.

New!

Business Standard

Business Standard is much more than a complete accounting package. With a built-in employee time clock and bar code and mailing label creation capabilities, you have all the features you need to run a small business or mail order company. (Larger organizations, such as manufacturers, distributors, and wholesalers, will love the password protection and security!) You can even track commission levels and sales by individual. Of course, Business Standard allows you to perform all standard accounting functions. You can instantly look up inventory items, customer and purchase orders, as well as generate standard and customizable reports, invoices, work orders, and estimates. Business Standard *sets* the standard for complete business solutions.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.7.

CHAE

7057 Business Standard

If anyone has it, we do!

And always at a great price! Our custom database lets us manage our vast inventory with precision. So if it's available from the manufacturer, we've got it in stock – just a day away from your door.

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Greg LeMond's Bicycle Adventure

Greg LeMond's Bicycle Adventure is an interactive voyage around the world. Experience the role of bicycling in other societies. Every trip is a different experience! GOLF Who What Why When Where will give you a new perspective on this most compelling sport. And you get Lee Trevino's Priceless Golf Tips video, FREE.

Minimum requirements: LCII, 5MB RAM, System 7, 13" 256 color monitor, CD-ROM drive.

Eden Interactive

6921 Greg LeMond's Bicycle Adventure (Mac & DOS) (pictured)
6922 Greg LeMond's Bicycle Adventure CD-ROM (Mac only) ..... $48.
6923 GOLF Who What Why When Where CD-ROM (Mac & MPC) ..... $48.

$32.

Lights Out Sports Fans

Every baseball fan should have this screen saver to prevent screen burn-in. Choose from ten "game plan" modules and control aspects of each. Watch a simulated baseball game played out using actual baseball statistics in the Game Time module. You pick which teams play. Or watch a carnivorous blimp prowl the sky devouring team logos.

Minimum requirements: 1.3MB RAM, System 6.0.5.

Quadrangle

6929 Lights Out Sports Fans (pictured)
7365 Lights Out Sports Fans – Hockey ..... $32.

New!

$36.

Spin Doctor

Swing, flip, and bounce past enemies in Spin Doctor, the arcade-style, animated game of skill. Navigate through a 100-level, moving obstacle course of nasty rotating wands, spikes, acid droplets, moving doors, fuses, bombs, and much more in amazing 256-color animation. Spin Doctor is unlike any game you've ever seen – a game addict's dream!

Minimum requirements: Any Mac supporting 256 colors or gray scale.

Callisto

7028 Spin Doctor

$39.

Pathways Into Darkness

Think fast! You'll have to if you're going to keep up with continuous-motion, 3D, texture-mapped graphics, *and* defeat an alien demon. Separated from your secret special forces team, you travel over 4 million square feet alone to save the world. Beautifully rendered graphics and active panning stereo sound combine to make Pathways Into Darkness the closest thing to virtual reality without a helmet. And, the smooth-scrolling, first-person interface works well with any 256-color Mac. If you need a little help on your mission, the *Official Pathways Into Darkness Hint Book* guides you through Pathways' levels, monsters, and strategies. Plus, you get maps, tips, and a level by-level walk-through.

Minimum requirements: Any 256 or 8-bit color Mac, 1MB RAM, System 6.0.5, 5MB hard disk space.

Bungle Software

6639 Pathways Into Darkness (pictured)
7367 Official Pathways Into Darkness Hint Book ..... $13.

$49.

FLOWERscape

Plan your spring garden now with FLOWERscape! View its growth in color, as it would appear in any month of the year. Through its easy-to-use interface, FLOWERscape helps you choose what to grow and where to grow it. Just enter soil, sun, and geographic information, and the program recommends suitable plants. Includes FREE pH test strips.

Minimum requirements: Any Mac with a 256-color monitor and high-density floppy drive, 1.5MB RAM, System 6.0.4, 8.5MB hard disk space.

Voudette

6701 FLOWERscape-Mac (pictured)
6702 FLOWERscape-Windows ..... $49.

$28.

Star Trek The Screen Saver

Beam out burn-in. Eddy award winner Star Trek The Screen Saver prevents burn-in with over 15 displays of Tribbles, Captain Kirk, Spock, and more. It's a stand alone product and fully compatible with After Dark's more than 30 displays.

Minimum requirements: Star Trek – Mac Plus, 2MB RAM, System 6.0.4. After Dark – Mac 512KE, 512K RAM.

Berkeley Systems

5341 Star Trek The Screen Saver (pictured)
1232 After Dark ..... $28.
3523 After Dark & More After Dark Bundle ..... $39.

New!

$41.

ReadySetGrow!

ATTENTION PARENTS! This fun, interactive guide combines animation, illustrations, sound effects, and text to cover parenthood from prebirth to age 5. Explore Family Profile to help "predict" your child's looks or determine potential risks. Medical Records with electronic growth charts, "Biological Clock," Pregnancy Timetable, and much more make this the most comprehensive parents' program available.

Minimum requirements: Any Mac with 1MB RAM, System 6.0.5, hard drive.

Atlantis

6991 ReadySetGrow! (pictured)
6992 ReadySetGrow! Windows ..... $41.

$39.

Sailing Master

Don your sailing cap and deck shoes as you race against your Mac and learn how to sail without getting wet. Sail against as many as three boats, and learn about wind shifts. Course options, skill levels, hazards, and other features offer a challenge for land lubbers and old salts alike. "Sailing Master is a lot of fun – well worth the price," says Macworld. (Nov. '93)

Minimum requirements: Mac 512K.

Starboard Software

5318 Sailing Master

New!

$38.

SIM City 2000

Do you see yourself as a benevolent leader – or an evil dictator? Explore either fantasy as you create and rule your own city.

Build schools, museums, marinas, prisons, and more. Light these buildings with any of nine different power sources including wind and solar. Create highways, bridges, train and bus depots, and subways for all your SIM commuters. Then, view your 3D animated city and its residents in 256 colors. If you like what you've created, sit back, listen to some music and read the local newspaper. But don't get too comfy! An earthquake, fire, or even aliens could strike your city at any time! Beginners will love the simplicity while experienced players will appreciate the advanced features available.

Minimum requirements: Mac LC, 4MB RAM, System 7.0, hard drive, color monitor with 8-bit graphics.

MAXIS

6692 SIM City 2000

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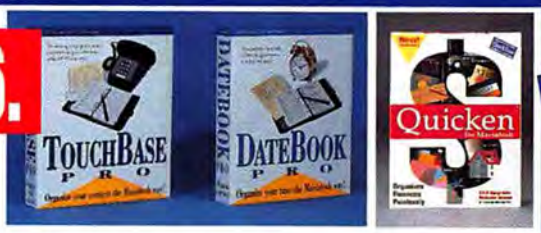

DATEBOOK PRO, TOUCHBASE PRO, and Quicken 4 Bundle

DATEBOOK PRO and TOUCHBASE PRO are now totally integrated, and with this specially priced bundle, you can organize your finances, save money, and save time. DATEBOOK PRO is a powerful calendar and time-management program. Calendars scheduling, to-do lists, and alarms combine to keep you informed. TOUCHBASE PRO stores information about your personal and business contacts. Print Rolodex cards, address books, envelopes, and more. Move from office to home without missing a beat. File synchronization updates records automatically. And Quicken 4.0 is the latest version of the popular personal and small business finance program. Print and automatically address checks, update your check register, keep track of tax information, and print detailed reports.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.5, a hard drive or external floppy.

Aldus Consumer Division

7056 DATEBOOK PRO, TOUCHBASE PRO, and Quicken 4 Bundle

MAC'S PLACE EXCLUSIVE BUNDLE

Handle all your appointments and correspondence with one bundle at one great price!

$99.

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Get the best organizational tool, easiest-to-use time organizer, and an award-winning word processor – for one great price! **In Control** lets you manage all your activities by priority, due date, or project and then print outlines, lists, and calendars for your personal organizer using FREE DynoPage Lite. After organizing your priorities, use **InTouch** to maintain contacts – and then print envelopes, labels, fax cover sheets, and more! Finally, using **WriteNow**'s 135,000-word spell checker, color text, graphics capabilities, and a 1.4 million word DA thesaurus, you'll make great impressions with accurate and beautiful letters. Mail merge, virus detection, and much more make this a great bundle for PowerBook users!

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.7.

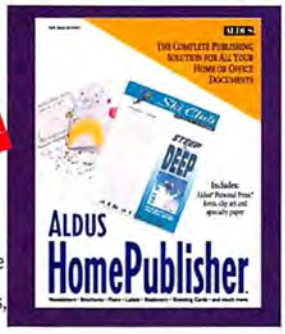
Attain/Advanced Software/T/Maker

ATTAIN ADVANCED SOFTWARE

6689/6718 IN CONTROL Bundle

$45.

New!



ALDUS HomePublisher.

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Minimum requirements: Mac Plus, 2MB RAM, System 6.0.7, hard disk.

Aldus Consumer Division

7245 Aldus HomePublisher

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MacInTax HeadStart Edition

Tax preparation without the headaches! MacInTax makes preparing your taxes easier, faster, and more accurate than ever before. Only MacInTax has EasyStep, which leads you through your tax return from start to finish, guiding you every step of the way. MacInTax contains everything you need to do your taxes quickly and accurately. Get started early with MacInTax HeadStart Edition. Buy the HeadStart version now and get the final version with IRS final approved forms free in January. MacInTax will transfer your information to the new forms automatically. Or get MacInTax and Quicken together and stay on top of your finances year 'round

Minimum requirements: Mac Plus, 1MB RAM, floppy drive, System 6.0.5, and a hard disk. Supports color and monochrome monitors.

Chipsoft

7221 MacInTax Headstart Edition (pictured)

7223 MacInTax/Quicken Bundle ..... $54.

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The NEC 3FGE is the newest 15" MultiSync monitor from NEC. Special advanced flat square display technology gives you an edge-to-edge picture with increased brightness and contrast. The anti-static screen has a large 13.8" active display area with 640x480 resolution at 58dpi. And, it's easy to use! All of the contrast, brightness, and color controls are mounted on the front of the monitor for accessibility. Better cable design on the back of the monitor allows for an easier fit into tight spaces. And NEC offers a terrific 3 years parts and labor warranty. All of this at an incredibly affordable price! *This monitor complies with all Swedish MRPII emission standards.*

NEC

NEC
6261 NEC 3FGE

$179.

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1992 Publish Editors' Choice Awards WINNER

DeBabelizer

This international award-winning graphics-processing toolbox will save you time, effort, and money. It translates from and to over 50 bit-mapped graphic file and animation formats for Mac, DOS, Windows, Silicon Graphics, Sun Microsystems, Amiga, and others. Batch processing and internal scripting functions save time by automating repetitive manipulation and editing tasks. Create QuickTime blue-screen effects with background removal features. DeBabelizer will also report and display differences between original and revised images. This program compliments any paint, drawing, or image-processing program. *Publish* magazine says, "Every once in a while a breakthrough product comes along and revolutionizes your entire life; the wheel, electricity, and now DeBabelizer."*

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.7.

Equilibrium
6193 DeBabelizer

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DE BABELIZER THE GRAPHICS PROCESSING TOOLBOX

$128.

New!

Flo'

Wouldn't it be fun to turn your boss into a "conehead?" Flo's Freeform Plasticity™ makes it easy by turning any image into a stretchable plastic-like surface. Unlike morphing, you only need one image – or part of an image – to twist, push, pull, and turn! You can easily distort any PICT file and export it to numbered PICTs, TIFF, PICs, and QuickTime without degrading the original image quality. Graphic design professionals will appreciate the many features and beginners will love the ease-of-use. Flo' creates *fluid* animation sequences and provides unlimited key frames, automatic in-betweening, and ease-in/ease-out animation control – making it a great tool for QuickTime movie makers.

Minimum requirements: Mac II, 5MB RAM, System 6.0.5, math coprocessor; color monitor recommended.

The Valis Group
7354 Flo'

$4695.

SAVE OVER $150. ON OUR ALREADY LOW PRICE!

Radius Intellicolor & PrecisionColor Pro Bundle

With this bundle, you'll save more than $150 off our already low prices! This complete Radius display system includes a 20" Trinitron monitor and a 24-bit NuBus video card. The Intellicolor two-page monitor offers "on the fly" resolution switching and state-of-the-art color temperature control – even with the built-in video on Quadra and Centris models. With a tilt/swivel base and anti-glare screen, this monitor provides amenities you'll like and the performance you need. The PrecisionColor Pro video card gives you Quickdraw acceleration of up to 3000 percent! And it works with all NuBus Macs including Centris models, providing resolutions of 640x480 to 1152x882 on monitors up to 21".

Radius
7369 Radius Precision Pro Bundle (pictured)
6687 Radius Precision Color Pro ..... $1998.
6809 Radius Intellicolor 20" Display ..... $2848.

radius

How to Order

- Call 1-800-219-0009 anywhere in the USA or Canada. Call 1-406-758-8000 for international orders.
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- Mac's Place is open from 7 a.m. to 11 p.m. M-F Mountain Time, and 7 a.m. to 7 p.m. on Sat., and 8 a.m. to 6 p.m. on Sun.
- No sales tax (except OH residents add 6% to total, including shipping).
- VISA, MasterCard, Discover Card, American Express, OPTIMA, checks, and P.O.s gladly accepted. Your credit card is never charged until your product ships.
- All in-stock items ship same-day, (barring system failure, etc.) to your doorstep, for just $3 (USA) via Airborne Express overnight service. Rural locations may require an additional day for delivery. Areas not serviced by Airborne Express will be sent via Priority Mail.
- Our $3 shipping charge includes insurance at no extra charge.
- When a partial order is shipped, we pay freight on additional shipments.
- Many products carry a money back gurarantee (MBG).
- Defective software is replaced immediately with like items. Defective hardware items repaired or replaced at our discretion.
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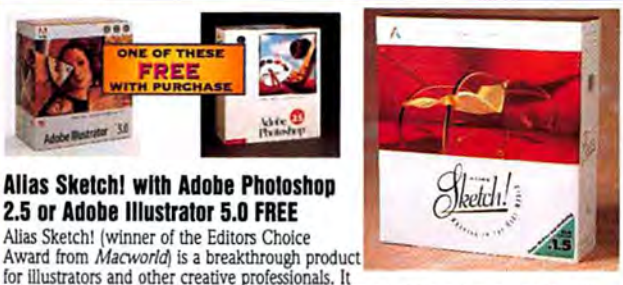

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Minimum requirements: Mac IIx, 8MB RAM, System 6.0.5, a hard drive.

Alias Research
6794 Alias Sketch! with Adobe Photoshop 2.5 ..... $748.
6795 Alias Sketch! with Adobe Illustrator 5.0 ..... $748.

Alias

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3.5" SyQuest mechanism; 105MB capacity; includes 1 cartridge and formatting utility. Comes with a 2 year warranty

PLI

Infinity 40 Removable Ext **$349**
Infinity 88/RW44 Removable Ext **$499**
Infinity 105 3.5" Removable Ext **$529**
1 GIG External Mini-Array **$2149**
2 GIG External Mini-Array **$2839**
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NEC

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Features a data transfer rate of 450 kb/sec & a 195 ms access time. Kodak Multisession PhotoCD™ & QuickTime compatible. Requires interface kit.

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DAYSTAR DIGITAL

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Universal PowerCaches
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50MHz/ w/68882 ..... **$563/$663**
FastCache Turbo **$165**
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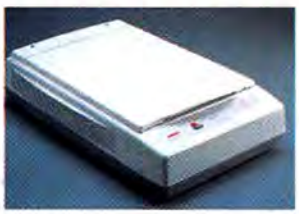

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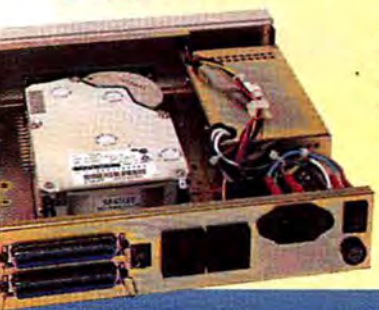

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Micropolis 680 (M2205)	*919*	*989*
Quantum 700 (PRO700)	*889*	*959*

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Fujitsu 1.08 (M2694)	*1019*	*1089*
Micropolis 1.25 (M2210)	*1029*	*1099*
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1080mb	11ms	$889	$949

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170mb	17ms	$249	$349
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FIVE YEAR WARRANTY

FUJITSU

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* One YEAR Warranty

Seagate

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2.4GIG	ST12400N		9ms	2000mb	$1699	$1759
1.9GIG	ST11950N	*Barracuda 1*	8ms	1350mb	$1599	$1659
2.4GIG	ST12550N	*Barracuda 2*	8ms	2050mb	$1949	$2009
5.25" FULL HEIGHT						
1.6GIG	ST41651N	Wren-8	15ms	1350mb	$1165	$1265
2.1GIG	ST42100N	Wren-9	12.9ms	1900mb	$1485	$1585
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ClubMac Dual 44mb		$549	

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ClubMac Dual 88c*		$779	

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2.0GIG	Archive Python	4mm	$979	$999
3-5GIG	Archive Turbo DAT*	4mm	$1255	$1275
2.0GIG	Hewlett Packard 35470A	4mm	$1079	$1099
3-5GIG	Hewlett Packard 35480A*	4mm	$1179	$1199
4-10GIG	Sony SDT-5000	DDS-2	$1379	$1399
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MACWORLD MW EDITORS' CHOICE
December 1993
ClubMac 5.25" Sharp MO

Part Number	Model	Capacity	Description	Seek	Internal	External
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CMO-M2511A	Fujitsu	128mb	3.5" LP	35ms		$879
CMO-OMD5010	Epson MW	128mb	3.5" HH	45ms		$779
CMO-JY750 MW	Sharp	594/652mb	5.25" HH	40ms	$1669	$1699
CMO-C1716T	HP	1.3GIG	5.25" FH	24ms		$2729

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- Comp. with on-board graphics on the Quadra and Centris

MacUser Magazine
January 1993

E-MACHINES

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E-Machines T20 Multi-Mode Color	$2429

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MONITORS

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SuperMatch 20T Multimode XL	$2539
SuperMatch Plus 20" Color	$1649
SuperMatch 17T	$1049

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Thunder/24	$2159
ThunderLight	$1669
Spectrum/24 PDQ Plus / Series IV	$1259 / 789

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Horizon 24	$Call
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PaintBoard Turbo / Li	$1099 / 779
8XLi / 8XL	$899 / 459
ColorBoard 264/SE307	$459

MULTIMEDIA

MoviePak Presenter	$1799
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MoviePak2	$1549
MediaTime	$1485
24XLTV / 24MXTV	$2529/1639
24STV	$719

radius

WORRY-FREE SERVICE WARRANTY

MONITORS

IntelliColor Display/20	$2589
PrecisionColor Display/20v	$1869
PrecisionColor Pivot	$819
Mono. Pivot Display/E	$565
Full Pg Display (FPD)	$445
Two Pg Display 20GS	$809
Two Pg Display 21GS	$1055

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PrecisionColor 24X	$1495
PrecisionColor 24XK	$769
PrecisionColor 8XJ	$475
Color Pivot/Pivot	$489 / 249
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FN10TA	10T FriendlyNet Media Adapter	$65
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MC+IIE64	Mac II & Perf 600, Thk/Thn, 64K	$145
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Single Port 10BT or Thin	$69
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MacWorld MW Editors' Choice January 1994

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SilentWriter 640 features:

- 6ppm / 300 dpi laser
- Genuine Adobe PostScript Level 2
- 52 scalable fonts
- True Type Rasterizer
- 3MB RAM with FMT

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Silentwriter 97	$1119
Silentwriter 640	$799

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- U.S. Atlas
- World Atlas
- Mayo Clinic
- Lucas Game Pack II
- The Animals
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Bronze / Silver / Gold ..... $165 / 255 / 279

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Bronze / Silver / Gold ..... $105 / 255/ 279

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SupraFaxModem 14.4 V.32bis, V.42bis Standalone	$209
SupraFaxModem 14.4 V.32bis, V.42bis w/FAXstf & Micro	$235
SupraFaxModem PB 14.4 V.32bis, V.42 Internal for Powerbook	$279
Supra 2400 Baud External Modem	$69

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Trans Unit / ADF	$765/465

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* Req'd for non-Mac IIci, IIvi, IIvx, Performa 600

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NuDesign Full Page Greyscale

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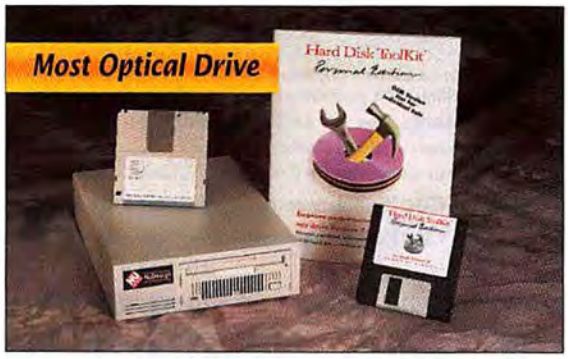

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2.4 Gig 5.25" 11.5ms, 5yr warr, 300,000 MTBF, Fast SCSI	$1628	$1728
NEW! 240 MB 2.5" Powerbook drive	$398	$478

*Mean Time Between Failure is the average life expectancy of a drive.

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C 170 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	$218	$258
C 340 MB 3.5" LPS, 9ms, 2 yr warr, 150,000 MTBF, Fast SCSI	call	call

These new Conner drives are so reliable, that Conner has been one of Apples largest suppliers of drives. The 150,000 hours Mean Time Between Failure and the incredible speed of the 540 are just two reasons to buy a Conner.

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16MB 70ns/60ns Non Composite	699/735
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PMO Sierra 1.3GI

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$475 SyQuest 105MB

SyQuest

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88C (R/W 44) SyQuest	$429
105MB SyQuest	$475

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SIZE	INTERNAL	EXTERNAL
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170MB	$219	$299
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270MB	$299	$369
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2.0GB	$1889	$2279

Powerbook

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PB HD Enclosure Nicad/AC Power	$149

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Excellent MacWEEK MAY 17, 1993

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Universal PowerCache

The PowerCache is an award winning design that gives you affordable 68030 performance and the best in compatibility. Just plug it in and go... no downtime and it works with everything. Upgradable to Turbo 040.

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Speedster 40Mhz **$1245**

MOBIUS

Speedster 040 40Mhz

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040 Speedster 25/25 W-FPU	625/799
040 Speedster 33/33 W-FPU	725/889
040 Speedster 40 W-FPU	1,245
Adapters for IIsi, IIcx, IIx, SE/30	45
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24XLTV	2,699
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Editing Aces Suite	2,979

MONITORS

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Sony GDM 2036s 20" MultiScan	2,189

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★★★★½

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1. For how many micro computers do you buy products? (check one)
☐ 01) 1-4 ☐ 02) 5-49 ☐ 03) 50+

2. Your primary job function is: (check one)
☐ 01) Administrative/ General Management
☐ 02) MIS/DP, Communications Systems, Programming
☐ 03) Engineering/R&D
☐ 04) Finance/Accounting
☐ 05) Marketing/Sales
☐ 06) Computer Dealer/VAR

3. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (check all that apply)

4. Which of the following products have you bought in the last 6 months? (check all that apply)

SOFTWARE:	Q3	Q4
Accounting	☐ 01	☐ 01
Spreadsheets/Financial Planners	☐ 02	☐ 02
Project Managers/Planners	☐ 03	☐ 03
Word Processors	☐ 04	☐ 04
Database Managers	☐ 05	☐ 05
Graphics/Presentation Software	☐ 06	☐ 06
Integrated Software	☐ 07	☐ 07
Communications	☐ 08	☐ 08
Utilities	☐ 09	☐ 09

HARDWARE:	Q3	Q4
Modems	☐ 10	☐ 10
Scanners	☐ 11	☐ 11
Microcomputers	☐ 12	☐ 12
Printers/Plotters	☐ 13	☐ 13
Monitors/Displays	☐ 14	☐ 14
Storage	☐ 15	☐ 15
Add-in Boards	☐ 16	☐ 16
Networking	☐ 17	☐ 17

5. If so, what function do you serve in the buying process? (check all that apply)
☐ 01) Initiation/ Determine Need
☐ 02) Selection of Brand and Model
☐ 03) Selection of Source
☐ 04) Authorization
☐ 05) Other

6. Over the next 12 months, how much will your organization spend on computer products or services? (check one)
☐ 01) over $5 million
☐ 02) $1 - 5 million
☐ 03) $500,000 - $999,999
☐ 04) $100,000 - $499,999
☐ 05) $50,000 - $99,999
☐ 06) $10,000 - $49,999
☐ 07) under $10,000

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Database Managers	☐ 05	☐ 05
Graphics/Presentation Software	☐ 06	☐ 06
Integrated Software	☐ 07	☐ 07
Communications	☐ 08	☐ 08
Utilities	☐ 09	☐ 09

HARDWARE:	Q3	Q4
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Scanners	☐ 11	☐ 11
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Full-page Display *MacUser, July '93*

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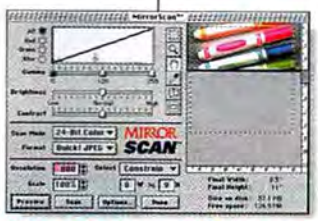

MirrorScan's powerful features make scanning a snap

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Mirror's award-winning scanners start with a precision three-pass scanner engine for superb color registration and sharpness. Then we add hardware pre-scan gamma correction for top quality results in much less time. The Mirror Color Scanner is available in 600, 800 and now 1200 dpi models to fit every budget.

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Every Mirror 600, 800 and 1200 scanner includes the Plug-in, application and desk accessory versions of MirrorScan, along with a full version of Adobe Photoshop 2.5 and Read-It! Pro 3.0 OCR.

MACWORLD* MW EDITORS' CHOICE MW ★★★★

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(includes Photoshop 2.5 and Read-It! OCR)

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- Apple Adjustable Keyboard
- ABC Software Bundle & Cables

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APS MX 540[2] Maxtor MXT540 mechanism	749	819	839
APS MS 1.2G[5] Micropolis 2212 mechanism	999	1069	1089
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APS Q 1225[5] Quantum 1225S mechanism	999	1069	1089
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520MB	3.5"	9MS	$ 575	$ 635
1.2GIG	3.5"	8.5MS	$ 850	$ 910
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1.6GIG*	5.25"	15MS	$ 1149	$ 1249
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CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
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1.3-8GIG	Archive Turbo*	4MM	$ 1139	$ 1199
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1.3-5GIG	Exabyte 8205	8MM	$ 1539	$ 1599
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276-277

Product Categories

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CD-ROM		253	
Communications			
Computer Systems		253	
Data Acquisition			
Disk Drives	248	260	
Diskettes		260	
General		260	276
Input Devices	248		
Memory Upgrades		259-264	
Networking		265	
Peripherals	249	266	
Power Book Products	249		
Power Supplies			
Printers		267	276
Scanners		267	
Security			
Tape Drives			
Used Equipment			
Software			
Accounting			276
Back Up Systems			
Bar Coding		267	
Business	250		276
Business Time Management			
CAD/CAM		267	
CD-ROM	250	269	
Communications/Networking		269	276
Desktop Publishing			
Educational			277
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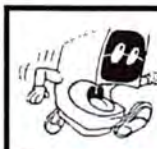

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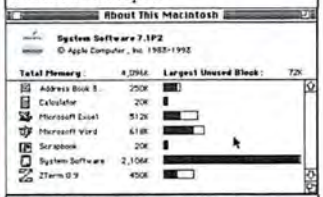

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QUANTUM 340 LPS 2 Yr.	329	389	399
QUANTUM 525 LPS 5 Yr.	585	645	655
QUANTUM 540 LPS 5 Yr.	Call	Call	Call
QUANTUM 540 Emp. 5 Yr.	Call	Call	Call
QUANTUM 700 Pro 5 Yr.	799	859	869
QUANTUM 1050 Pro 5 Yr.	885	945	955
QUANTUM 1080 Emp. 5 Yr.	979	1039	1049
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68882-25 MHz FPU, Flat Pak	**37**
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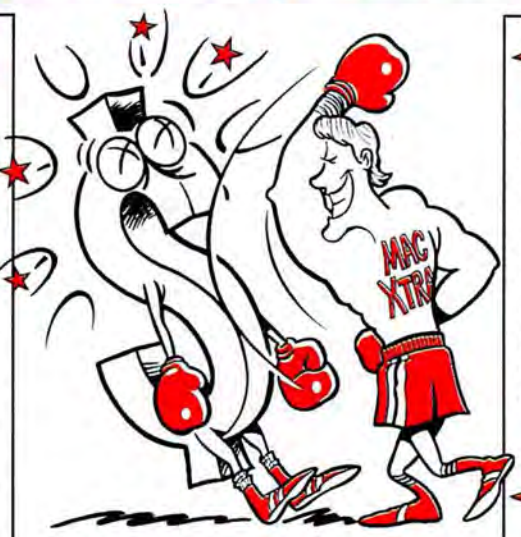

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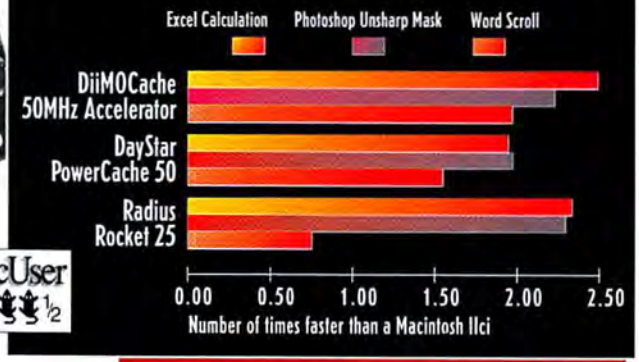

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525MB	LPS525	10ms	$895	$969
700MB	PRO700	10ms	$1179	$1239
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33 Mhz Turbo 040		$1349
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Source: MacUser 1992 Study of Microcomputer Product Ownership and Buying Plans

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270MB	12ms	4500	Quantum	2 Years	$258	$319
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340MB	12ms	4500	Quantum	2 Years	$359	$419
520MB	12ms	4400	Fujitsu	5 Years	$499	$579
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AV Model of above drive designed specifically for audio and video applications					$919	$999
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4-8Gig	DAT	Archive	88MB/min	$1209	$1229
4-8Gig	DAT	Hewlett Packard	42MB/min	$1179	$1199
4-10Gig	DDS-2 DAT	Sony	FAST	$1299	$1379
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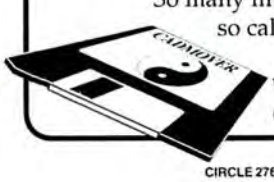

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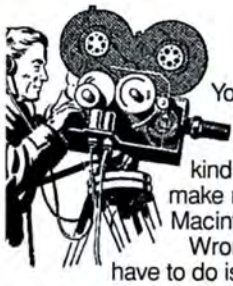

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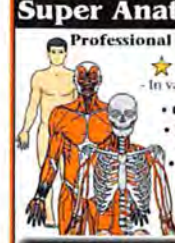

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The Front-Page Debate

WHEN REPORTERS refuse to use Macs to write on, it's not just because of the mouse.

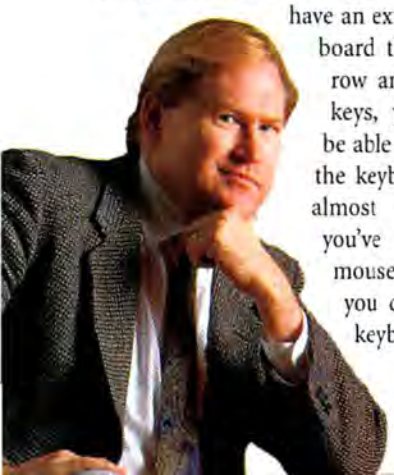
I was chatting with an editor at the *Vancouver Sun* about the system used to produce that newspaper. Essentially, they've gone to a Mac system (Quadra 700 workstations and Quadra 900 servers), all running QuarkXPress. What was interesting to me in my discussion was the current debate going on at the paper regarding PCs — you know, the dreaded clones! A lot of writers at the paper say they can't write on a Mac. They want PCs on the network to talk to the Macs. This probably means PCs running Windows and probably Microsoft Word, which looks the same on a Mac as it does on a PC.

Although a few years back, I appreciated the difference between using a Mac and using a DOS-based PC for writing, I can't see it anymore. Even the price difference isn't significant now.

Historically, the Mac required heavy mouse use and it was tough to use the "feet on the desk, keyboard in the lap" approach to writing. This is how I write, so I do most of my work on a PC, using a text editor.

For anything fancier than text generation, I prefer the Mac. The output is superior to everything else — including that of the best Windows machine.

But could I write on a Mac full-time? Sure! Using Nisus or even Word, as long as you have an extended keyboard that has arrow and function keys, you should be able to program the keyboard to do almost everything you've needed a mouse for. And you can put the keyboard onto your lap and write away. Using a super-readable font such as Delta on-screen, you should have no trouble getting far from the screen and seeing every word clearly.



So why is this Mac/PC debate erupting in some newsrooms? What is it about the Macintosh that generates any controversy at all? Is it that the Mac isn't perceived as a macho machine? After all, newswriters have always yearned for the good old days when the men wore hats and went out and boozed until all hours and smoked smelly, cheap cigars. The women reporters, what few there were back then, cussed and spit and solved murders. How does this compare to the meek little reporter sitting behind a Macintosh and using a mouse? Yuck. And from what I can tell, it's mostly the men who see the PC as a macho machine and the Mac as a girlie machine. This is borne out by the fact that many women seem to prefer the Mac to the PC. My wife, as I have pointed out in this column on numerous occasions, refuses to use a PC. When forced to use one, she moans and groans like nothing you've ever imagined.

But there are plenty of hotshot writers — Michael Crichton and Douglas Adams come to mind — who are big Mac users. Personally, I find that the thesauri, the dictionaries, and especially the spelling checkers for the PC are superior, but this kind of thing probably influences few professionals. Obviously, Crichton and Adams don't care.

It's All in the Games

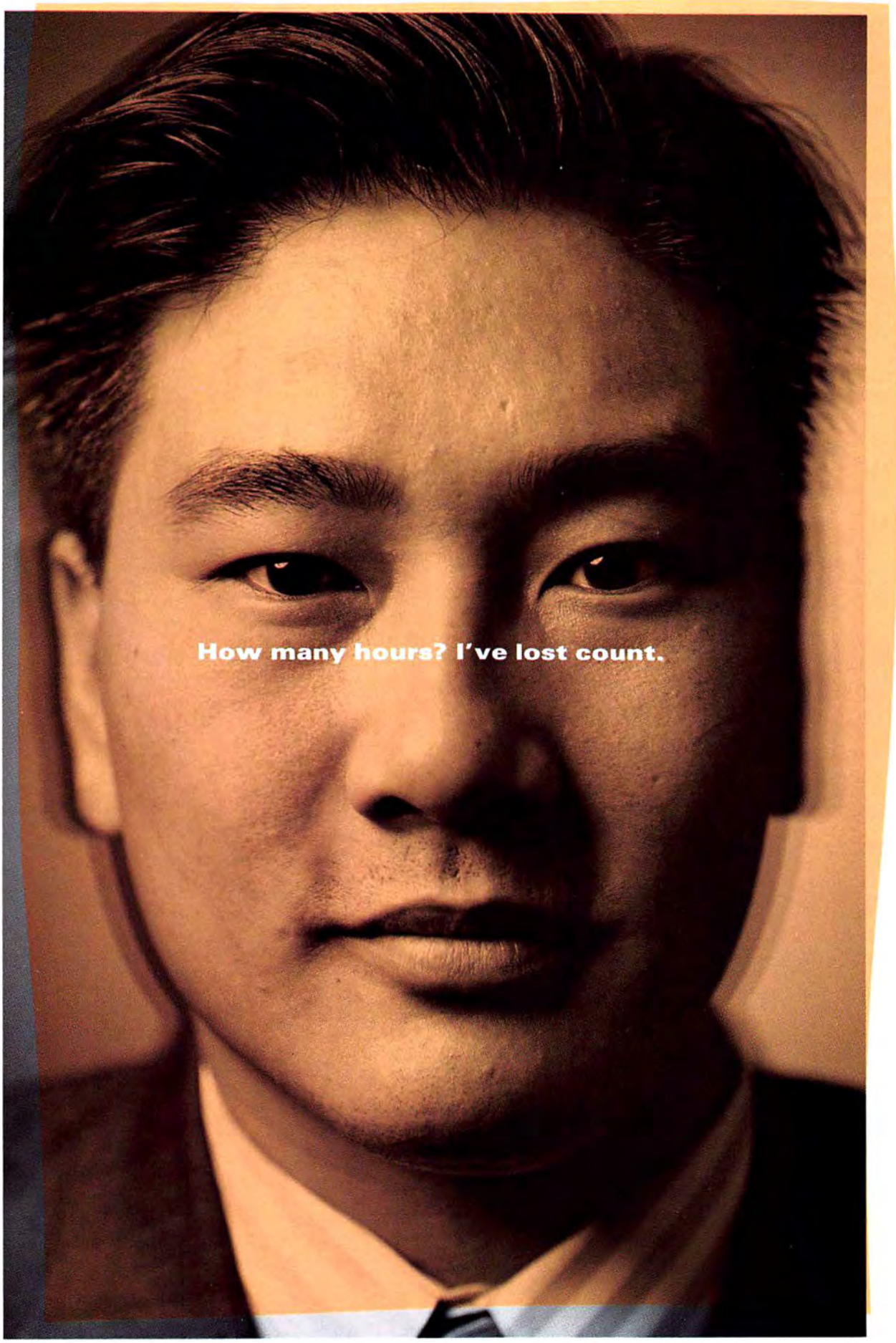
Then I tried to figure out what other, less obvious, reasons could account for the need for PCs. If I worked in a newsroom, why would I want a PC instead of a Mac? Games! The whole notion of it having to do with writing is hogwash. The PC is a better game machine than the Mac. There are more of those screwball flying-around-in-a-jet-and-blowing-up-Arabs games for the PC. There are public-domain games that are better than a lot of Mac games. That's all there is to it. Now before you tell me about cool games such as Myst or other outstanding CD-ROM games for the Mac, you have to remember that the workstations at a newspaper won't have a CD-ROM drive unless it's dedicated to some news source and on the network. So forget it.

Now I suppose some bean counter at the *Des Moines Register* will cut out this column and show it to all the griping journalists who want Macs *and* PCs and tell them that this "expert" says this is just about game playing. Thus a group of writers will hate my guts for spoiling their fun. Sorry. You can always say the point I made about spelling checkers is the reason.

The irony of all this is that the Mac is really the superior game machine, because it has a more advanced display system, but Apple tried in the early days to dissuade game development for the machine. The Apple II was the game machine, it said back then. The Mac is the business machine. Of course, the Mac has become the graphics-community machine above all else. It's too late to tell Apple that it shouldn't tell people how to use the Mac because it obviously has no clue about the direction of the industry and what attracts users. Whatever the case, my guess is that if a slew of hot Mac-*only* games came out, you'd have fewer people in Mac-only environments asking for PCs.

And how about a great spelling checker too?

ILLUSTRATION/ ROBERT ZIMMERMAN


How many hours? I've lost count.

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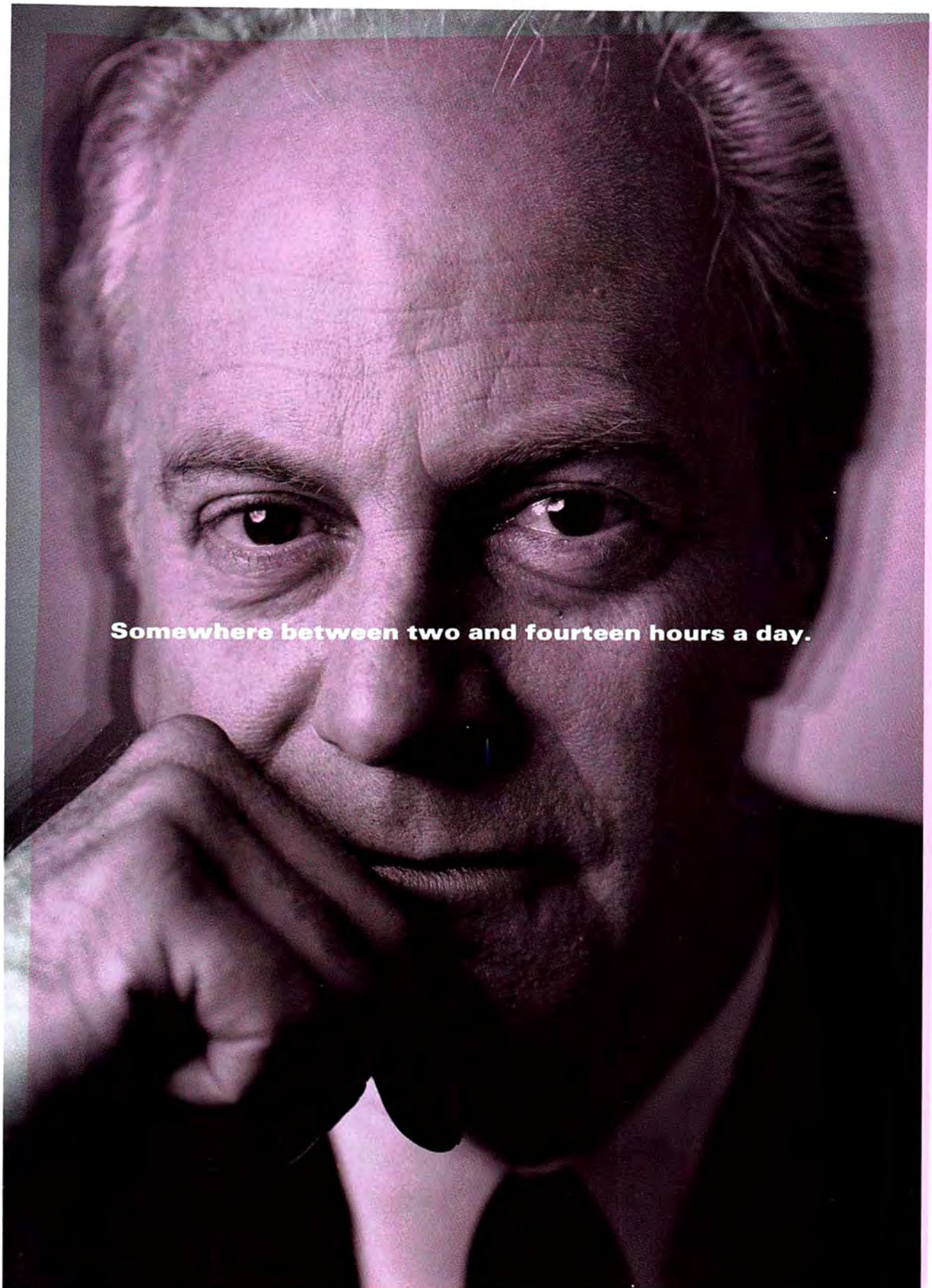

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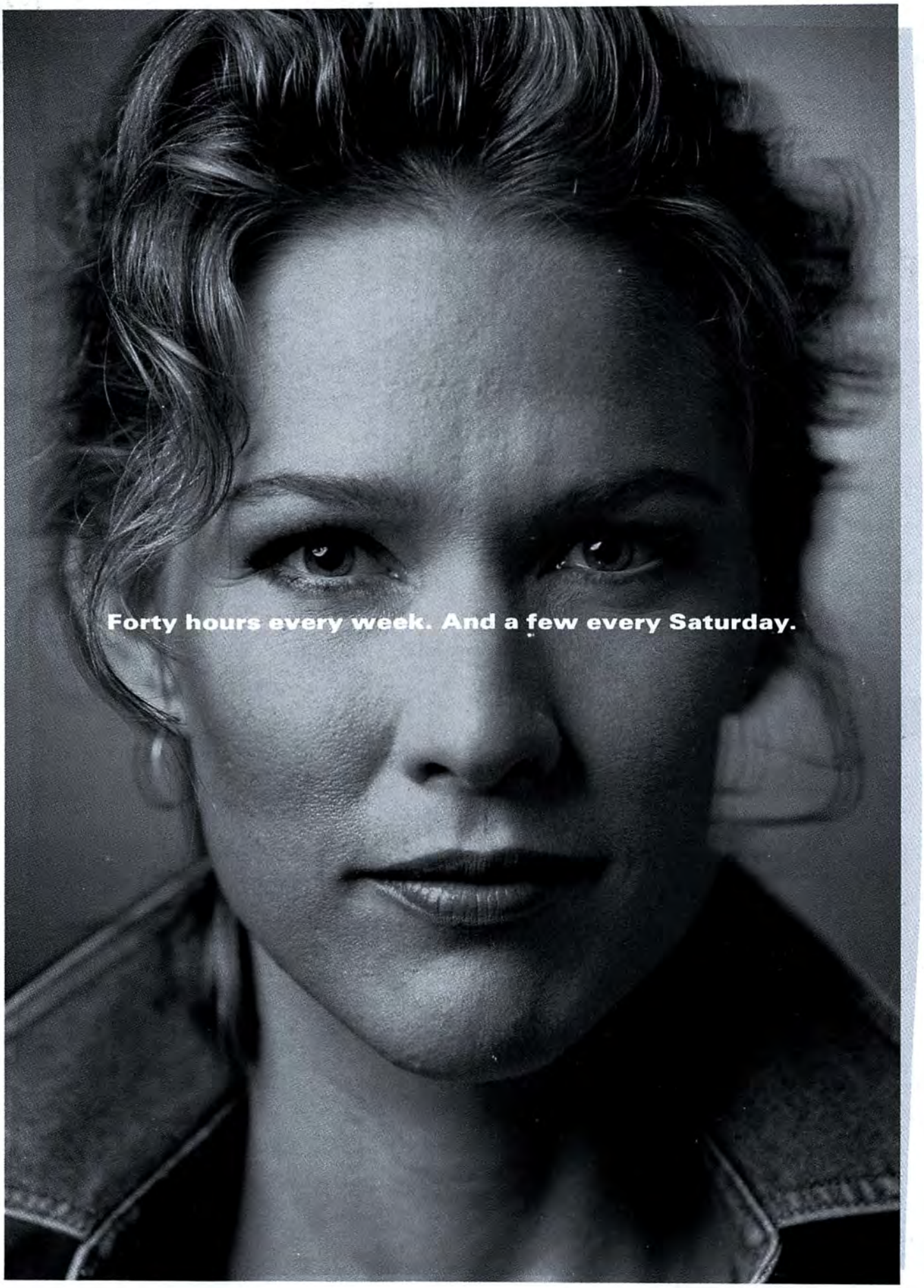
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